

*Global Perspectives on
Disaster Victim Identification Series*

Disaster Victim Identification

Experience and Practice



Edited by
S. Black • G. Sunderland
L. Hackman • X. Mallett



CRC Press
Taylor & Francis Group

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A Message From the Series Editor

Disaster victim identification is a global issue. Mass fatality events arise through both natural and manmade catastrophes, and the individuality of the characteristics associated with them ensures that each one offers independent learning opportunities so that we do not repeat the mistakes of the past, but learn effectively from our experiences. This UK edition will hopefully be the first in an international series whereby each country, or region, may wish to record the events in which they have experience and to highlight the learning outcomes from these tragedies. A second volume is currently in production from Australia and New Zealand, and I would respectfully invite other international DVI teams to take up the continuation of this series so that we might construct a global DVI library. I am very happy to make our experiences in the production of this volume available to others who may wish to follow, and if I can be of any assistance, please feel free to contact me on s.m.black@dundee.ac.uk.

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In the words of William Ewart Gladstone (1809–1898):

Show me the manner in which a nation cares for its dead, and I will measure with mathematical exactness, the tender mercies of its people, their loyalty to high ideals, and their regard for the laws of the land.

All royalties from the sale of this text pass to the charity Care of Police Survivors (COPS) (<http://www.ukcops.org/>). “Nobody understands the trauma of a line of duty death better than those who have endured it, and COPS places new survivors in touch with those who are prepared to help others through the difficult times that lie ahead. COPS is run by survivors for survivors.”

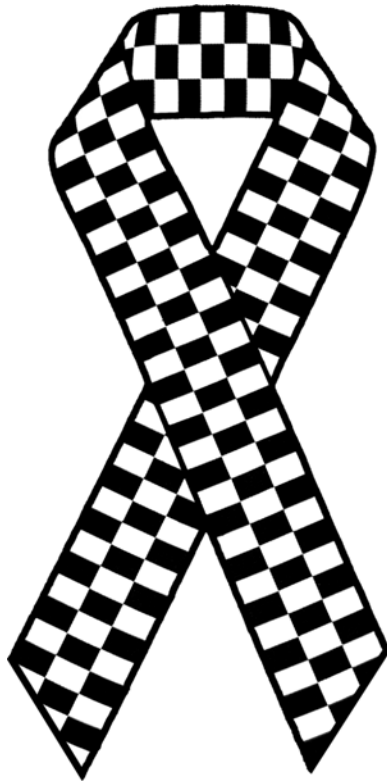


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Foreword

The Centre for Anatomy and Human Identification (CAHID) partnered with the Association of Chief Police Officers (ACPO), Centre for International Forensic Assistance (CIFA), National Police Improvement Agency (NPIA), and UK Disaster Victim Identification (DVI) to provide the advanced mortuary training course for the national UK DVI response capability. The first course ran in 2007, and the last in 2009 with close to 550 officers trained, representing each of the national police forces in the country. The United Kingdom responded to create a coordinated DVI capability in the aftermath of the Bali bombings, the Southeast Asian tsunami, the London bombings, and the Sharm-el-Sheikh bombings. Until this time, much of the UK response relied on the deployment of members of the Metropolitan Police Service, but it was clear that a more robust resilience was required.

The training course developed and run at Dundee was unique in police education. It consisted of a series of assessed tasks addressing both theoretical knowledge and practical understanding of DVI that culminated in the award of a postgraduate university degree. The theoretical knowledge coalesced around a textbook (UK DVI; *The Practitioner's Guide* by Black et al., 2010), which was coauthored by many expert practitioners in the United Kingdom. This 21-chapter text was converted into an interactive educational program and housed on Dundee University's virtual learning environment. Each chapter would open to students only once they had successfully completed the test for the previous chapter (i.e., achieved over 70%). At the end of the 21st chapter, an overall test covered every aspect of the DVI field from an understanding of the involvement of the Foreign and Commonwealth Office to fingerprinting to forensic odontology. The aim was not to make every officer into an expert in each field, but to give them sufficient understanding of the entire process to ensure that they could work in a more meaningful way with all the other practitioners that make up a team. We are proud to say that every officer who took the final test passed with over 60% as a final mark.

Each student then proceeded to a week of practical instruction. Officers all learned how to be scribes, to take photographs and fingerprints, and to work as part of a mortuary team. The team tasks were assessed, and again we are proud to say that every team passed the assessment that was overseen by a UK DVI commander. The dissecting room in CAHID was converted into a temporary mortuary, and the deceased were processed as if involved in a real

deployment, with care taken to omit any invasive procedures. Permission was obtained from those who bequeathed their remains for medical and anatomical instruction and approval was given by the office of Her Majesty's Inspector for Anatomy (Scotland). We acknowledge with respect and gratitude the selfless act of those who bequeath their mortal remains so that others may learn.

This then left just the final element for assessment. Each officer had to complete a 2,500-word essay on the following topic:

Research a mass fatality incident (in the United Kingdom or overseas) from any time period. Give a brief overview of the incident. Discuss what, in your opinion, was well executed and what could have been done better. How would you safeguard against these less than optimal situations occurring again, and how, with the benefit of hindsight, would you have tackled the problems faced by the original investigative team?

Each essay was scanned for plagiarism and was double marked. To be considered a pass, the essay had to be awarded either an A or a B grade, which equates to either a first-class award or an upper second. Students were permitted only one resubmission. This process resulted in the most amazing paper mountain: over 500 essays with an enormous collective knowledge of both modern and historic mass fatality events that occurred both at home and overseas.

We believed that, since the work had already been undertaken, a fitting tribute not only to the students but also to all of those who work in and train for mass fatality events would be a text that reminded us all of the history of this field in the United Kingdom. Taylor & Francis thought it an exciting project, especially as we believed it could be the first edition in a series of texts that could catalog mass fatality events around the world. We are delighted that Australia and New Zealand are now preparing the second text; in time, perhaps each of the Interpol DVI teams will have a record of the history of this field for their country providing a progressive catalog of information that would serve to remind of our past and inform for our future.

Each chapter was written from open-source material and used students' DVI essays as a basis on which to commence the review of each incident. Where possible, an officer from the force where the incident occurred was requested to coauthor the chapter with a member of academic staff from CAHID at the University of Dundee. While it is accepted that not every mass fatality event can be considered, we have selected those that are solely UK based and where major lessons were learned or that resulted in changes in practice or legislative alteration.

The success of every DVI operation relies heavily on the commitment and professionalism of the men and women who serve to identify the deceased and help to bring closure to their friends and families. This text is dedicated to all who serve and, more importantly, to those whom we serve.

Professor Sue Black, OBE, BSc, PhD, DSc, FRSE, FRAI, HFRCPSG
Director of CAHID

Editors

Sue Black is director of the Centre for Anatomy and Human Identification (CAHID), University of Dundee. Professor Black was awarded a police commendation by the Association of Chief Police Officers (ACPO) in 2008 for development and implementation of the UK National Advanced Disaster Victim Identification training course.

She holds a bachelor of science (honors), a doctorate in human anatomy, and an honorary DSc in recognition of services to forensic anthropology. She is a fellow of the Royal Society of Edinburgh and the Royal Anthropological Institute and honorary fellow of the Royal College of Physicians and Surgeons of Glasgow.

Professor Black has over 25 years of experience in criminal and coroners' courts in the United Kingdom, Europe, and the United States. In her professional capacity as a forensic anthropologist and in matters pertaining to human identity, she has assisted the British government, various European and foreign governments, national and international police forces, military investigations, the United Nations, and the Federal Bureau of Investigation. She is a registered expert on the temporary register of the Forensic Regulator and a registered practitioner with the National Police Improvement Agency. Professor Black is the founder of the British Association for Human Identification (BAHID) and its immediate past president. She is a founding director of the Centre for International Forensic Assistance (CIFA) and was awarded an OBE (Order of the British Empire) in February 2002 for services to forensic anthropology in Kosovo. In 2008, Professor Black was awarded the Lucy Mair Medal by the Royal Anthropological Institute for services to humanity through forensic anthropology.

Graham Sunderland retired in 2009 as assistant chief constable in Cumbria, where he had been in charge of Crime and Operations since 2004, prior to which he spent 25 years in West Yorkshire. He has held many positions within the police service, having acted as senior investigating officer and base control unit commander. In addition, Mr. Sunderland was the north-east regional hostage negotiator coordinator and the head for public protection issues as a detective chief superintendent. He was senior identification manager for the Selby rail crash and reviewed the response to the Southeast Asian tsunami on behalf of Interpol in 2005. Mr. Sunderland subsequently

became the Association of Chief Police Officers UK lead for disaster victim identification (DVI) and is currently the strategic director for UK DVI and the deputy chair of the Interpol DVI Standing Committee. He holds a bachelor of arts in organizational studies and a postgraduate diploma in criminology from the University of Cambridge. Mr. Sunderland was awarded the Queen's Police Medal in 2009.

S. Lucina Hackman is the national disaster victim identification program coordinator for the advanced training program based in the Centre for Anatomy and Human Identification (CAHID), University of Dundee. She is involved in teaching at both undergraduate and postgraduate levels as well as supervising research projects. She is studying for a PhD, under the supervision of Professor Sue Black, investigating the identification of age in living individuals as applied to asylum applications and those seeking refugee status. She holds an MSc in biological and forensic anthropology and is a consultant on the Virtual Anthropology Consultation Service (VACS) run by CAHID. She has worked a significant number of forensic cases both nationally and internationally and is a registered expert on the National Police Improvement Agency register.

Xanthé Mallett is lecturer in the Centre for Anatomy and Human Identification. She holds a first-class (honors) degree, a master's by research degree (CANTAB), and a doctorate in forensic facial recognition. She has over 7 years of experience analyzing human craniofacial biometrics. Dr. Mallett was part of a team that traveled to Brazil to teach best practice in human skeletal identification and has coauthored a considerable number of forensic reports for UK police forces. In her professional capacity as a forensic anthropologist she undertakes casework and research, and teaches techniques in human identification at both the undergraduate and postgraduate level. Her area of expertise is in the comparison of hand images, commonly applied to forensic cases involving digital images. She was involved in the disaster victim identification training and is a council member and membership secretary for the British Association for Human Identification.

Contributors

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Kent Police

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Greater Manchester Police

Steve Griffiths

Kent Police

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University of Dundee

Derek Hiley

Grampian Police

Mark Lynch

South Wales Police

Xanthé Mallett

University of Dundee

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RUC/PSNI (retired)

Neal Rylatt

West Yorkshire Police

Graham Sunderland

UK DVI Strategic Lead

Graham Walker

Metropolitan Police Service (retired)

Thomas Walsh

West Yorkshire Police

David Weller

Kent Police

David Wood

Greater Manchester Police

Relevant Acronyms

A

A&E: Accident and emergency

AAIB: Air Accident Investigation Branch

ACC: Assistant chief constable

ACPO: Association of Chief Police Officers of England, Wales, and Northern Ireland

ACPOS: Association of Chief Police Officers in Scotland

AFIP: Armed Forces Institute of Pathology

AFIS: Automated fingerprint identification system

AM: Antemortem

APT: Anatomical pathology technologist

ATC: Air traffic control

B

BAHID: British Association for Human Identification

BCU: Basic command unit

BCUC: Basic command unit commander

BRI: Bradford Royal Infirmary

BRIT: Body Recovery and Identification Team

BTP: British Transport Police

C

CAHID: Centre for Anatomy and Human Identification

CBLO: Casualty Bureau liaison officer

CBSAP: Casualty Bureau Standard Administrative Procedures

CC: Chief constable

Chinese MPS: Chinese Ministry of Public Security

CID: Criminal Investigation Department

CIFA: Centre for International Forensic Assistance

CODIS: Combined DNA index system (US)

COPS: Care of Police Survivors
CPS: Crown Prosecution Service
CSI: Crime scene investigator
CSM: Crime scene manager
CSP: Central Scotland Police

D

DA: Disaster Action (charity)
DC: Detective constable
DCC: Deputy chief constable
DCI: Detective chief inspector
DCS: Detective chief superintendent
DI: Detective inspector
DMORT: Disaster Mortuary Operational Response Team (US)
DNA: Deoxyribonucleic acid
DOD: Department of Defence
DPMU: Disaster Portable Mortuary Unit
DPP: Director of public prosecution
DS: Detective sergeant
DSupt: Detective superintendent
DVI: Disaster victim identification
DVIT: Disaster Victim Identification Team

E

EOD: Explosive ordnance disposal
ERQ: East replacement quarters

F

FA: Football Association
FAC: Family Assistance Centre
FBI: Federal Bureau of Investigation
FEMA: Federal Emergency Management Agency (US)
FFNCC: Find Family National Call Centre (US)
FI: Formal inquiry
FLC: Family liaison coordinator
FLO: Family liaison officer

G

GMP: Greater Manchester Police

GNER: Great North Eastern Railway

GP: General practitioner

H

HC: Hertfordshire Constabulary

HESMIC: Hertfordshire Emergency Services Major Incident Committee

HM: Her Majesty

HME: Homemade explosive

HMRI: Her Majesty's Railway Inspectorate

HOLMES: Home Office Large Major Enquiry System

HQ: Headquarters

HSC: Health and Safety Commission

HSE: Health and safety executive

HST: High-speed train

I

ICS: Incident Command System (US)

IED: Improvised explosive device

IPCA: Independent Police Complaints Authority

IPCC: Independent Police Complaints Commission

IRA: Irish Republican Army

K

KADAP: Kinship and Data Analysis Panel

KIES: Kenyon International Emergency Services

KP: Kent Police

L

LAS: London Ambulance Service

LESLP: London Emergency Service Liaison Panel

LFB: London Fire Brigade

LLS: Laser line sonar
LP: Lancashire Police
LRF: Local resilience forum
LRRF: London Regional Resilience Forum

M

MAG: Marchioness Action Group
MAIB: Marine Accident Investigation Branch
MCA: Maritime and Coastguard Agency
MCG: Marchioness Contact Group
MCSI: Major crime scene incident
MDO: Mortuary documentation officer
MFE: Mass fatality event
MFI: Mass fatality incident
MIA: Manchester International Airport
MIAFS: Manchester International Airport Fire Service
MIR: Major incident room
MIRSAP: Major incident room standardized administrative procedures
MOD: Ministry of Defence
MODP: Ministry of Defence Police
MOJ: Ministry of Justice
MOM: Mortuary operations manager
MOU: Memorandum of understanding
MPB: Missing Persons Bureau
MP: Member of Parliament
MPS: Metropolitan Police Service
MRCC: Maritime Rescue Coordination Centre
MSP: Member of the Scottish Parliament
MSU: Mobile support unit
MSV: Multi support vehicle
MTP: Merthyr Tydfil Police
MVIED: Motor vehicle borne improvised explosive device

N

NAFIS: National Automated Fingerprint Identification System
NCB: National Coal Board
NCIS: National Criminal Investigation Service
NCO: Noncommissioned officer

NDNAD: National DNA Database
NE: Northeast
NEMA: National Emergency Mortuary Arrangement
NHS: National Health Service
NI: Northern Ireland
NIR: National incident room
NMAT: National Mutual Aid Telephony
NNMC: National Naval Medical Centre
NOK: Next of kin
NPIA: National Police Improvement Agency
NSY: New Scotland Yard
NTSB: National Transportation Safety Board

O

OC: Operational commander
OCME: Office of the Chief Medical Examiner (US)
OHU: Occupational Health Unit
OICID: Officer in charge of identification
OPCAL: Occidental Petroleum (Caledonia) Limited
ORR: Office of Rail Regulation

P

PBIB: Potters Bar Investigation Board
PC: Police constable
PCA: Police Complaints Authority
PCO: Police communication officer
PE: Physical education
PI: Public inquiry
PLA: Port of London Authority
PM: Postmortem
PNSC: Police National Search Centre
POLSA: Police search adviser
PPE: Personal protective equipment
PSNI: Police Service of Northern Ireland
PST: Police search trained
PSV: Pressure safety valves
PTS: Posttraumatic stress
PTSD: Posttraumatic stress disorder

Q

QC: Queen's Counsel

R

RAF: Royal Air Force

RAIB: Railway Accident Investigation Branch

RARDE: Royal Armament Research and Development Establishment

RDТ: Rapid deployment team

RFID: Radiofrequency identification

RIR: Royal Irish Regiment

RIRA: Real Irish Republican Army

RIV: Rapid intervention vehicle

RLI: Royal Lancashire Infirmary

RNLI: Royal National Lifeboat Institution

ROUV: Remotely operated underwater vehicle

ROV: Remotely operated vehicle

RPM: Revolutions per minute

RSCH: Royal Sussex County Hospital

RTC: Road traffic collision

RUC: Royal Ulster constabulary

RVP: Rendezvous point

S

SAR: Search and rescue

SARDA: Search and Rescue Dog Association

SCCRC: Scottish Criminal Cases Review Commission

SERM: Scene evidence recovery manager

SIM: Senior identification manager

SIO: Senior investigating officer

SOCO: Scene of crime officer

SOP: Standard operating procedure

SP: Sussex Police

SPRIT: Special Psychiatric Rapid Intervention Team

SRI: Stirling Royal Infirmary

SRM: Survivor reception manager

SS&RT: Specialist Search and Recovery Team

SSS: Side-scan sonar

SYMAS: South Yorkshire Metropolitan Ambulance Service

T

TPU: Timer power unit

TRM: Trauma risk management

TSI: Thames Safety Inquiry

TTVI: Thai Tsunami Victim Identification

TVP: Thames Valley Police

U

UCH: University College Hospital

UKDVI: United Kingdom Disaster Victim Identification

UKDVIT: United Kingdom Disaster Victim Identification Team

UMC: Unique medical condition

UOD: University of Dundee

URN: Unique reference number

USAR: Urban search and rescue

V

VHF: Very high frequency

VIP: Victim identification profile

VRIC: Victim Repatriation and Identification Commission

VRIT: Victim Recovery and Identification Team

VRM: Victim recovery manager

W

WRVS: Women's Royal Voluntary Service

Introduction

The DVI Casebook, UK Incidents

1

XANTHÉ MALLETT
LUCINA HACKMAN
SUE BLACK

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Mass Fatality Incidents Considered in This Text

A professional and successful disaster victim identification (DVI) deployment relies on preparedness, advanced communication networks, inter-agency cooperation, crisis management capabilities, efficient implementation of emergency plans, and a response by trained personnel. In any mass fatality event an early, rapid deployment of a DVI reconnaissance team led by an experienced DVI commander is essential if the requirements of victim recovery and identification are to be met to the standard of excellence required. A “Gold,” “Silver,” “Bronze” command structure (or, respectively, Strategic, Tactical, and Operational) is used by UK emergency services to establish a hierarchical framework for the command and control of major incidents and disasters, including mass fatality incidents (MFIs). While this system does not explicitly signify hierarchy of rank, the chain of command loosely follows rank order, with the most senior and experienced officers tending to occupy key roles. This structure was adopted for response to disasters; however, it has been successfully used for all manner of preplanned operations, including football matches and firearms operations. The individuals for each element of the team are selected largely as a result of the police area (Figure 1.1) in which the incident occurs and in recognition of their training and experience.

A mass fatality preparation and deployment is divided into four key stages:

1. Preparedness phase: This is a continuous cyclical component, centered on planning, organization, and training for different disaster scenarios.



Figure 1.1 The 52 UK police forces: England, Scotland, Wales, and Northern Ireland. Correct at the time of writing.

2. Mitigation phase: Aims to prevent events occurring. With many types of incident, such as global natural disasters (Southeast Asian tsunami on December 26, 2004), little can be done in terms of prevention. Other circumstances can be more actively prepared for (e.g., attacks on travel infrastructure July 7, 2005, London bus and tube bombings; London 2012 Olympics in terms of antiterrorism policing).
3. Response phase: Focuses on dispatching a team of first responders to the disaster area to provide immediate aid to surviving victims. This is a flexible period that can stretch from a few hours to days. The DVI process can also take place during this initial phase once the survivors have been dealt with (see the following list A–E).
4. Recovery phase: This element aims to restore functionality as quickly as possible.

The response component, which covers the victim recovery and identification aspect of a mass fatality incident (item 3), is further subdivided into five processes (A-E):

- A. Documentation and retrieval of human remains from the scene
- B. Gathering information from family members (casualty bureau, missing persons' reports); collection of antemortem (AM) data by family liaison officers (FLOs)
- C. Examination of victims of the disaster at the mortuary; collection of postmortem (PM) data
- D. Reconciliation of AM and PM data to identify victims in preparation for the identification commission, usually chaired by a coroner (England, Wales, and Northern Ireland) or procurator fiscal (Scotland) and subsequent release of the deceased to the families.
- E. Debriefing of personnel. This phase relates to the critical evaluation of the whole DVI process through a series of debriefs and process review.

Following a mass disaster, a number of elements of body recovery and identification combine to facilitate victim identification, all of which are equally vital to obtain sufficient information for each individual (Figure 1.2), allowing a secure match between a known missing person and a deceased victim. The last aspect, debrief and process review, has two main functions. The first (debrief)

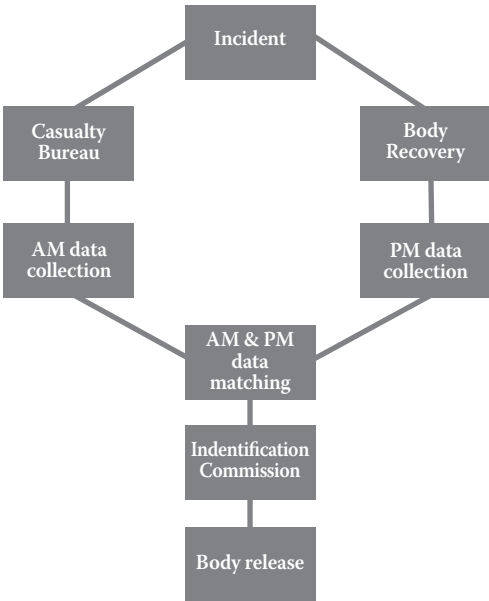


Figure 1.2 Broad summary of the DVI process.

aims to ensure that the health of staff involved with the deployment is not adversely affected, and the second element (process review) focuses on learning any lessons that become apparent and may influence future deployments.

Police forces geographically amalgamate into 11 regions (comprising eight in England, one in Wales, one in Northern Ireland, and one in Scotland), and depending on where an incident occurs there may be either a regional or a local response. In terms of an overarching response, incident control will lie either within the Association of Chief Police Officers' (ACPO) jurisdiction for England, Wales, and Northern Ireland or that of an Association of Chief Police Officers of Scotland (ACPOS) within Scotland. The United Kingdom as a whole consists of 52 separate police forces plus a number of additional forces, including British Transport Police (BTP), Civil Nuclear Police, and the three island forces of Guernsey, Jersey, and the Isle of Man. This structure, although correct at the time of writing, may change significantly in 2010 as a result of potential amalgamations in response to rationalizing of resources. The 52 forces have been retained for this text to reflect accurately the principal responding force to the incidents considered and are detailed in Table 1.1, along with the 11 regions within which each falls. Figure 1.3 shows the 11 regions, together with chapter number for each of the events covered in the text, to illustrate the geographical distribution of the incidents across the whole United Kingdom.

Each chapter generally covers a number of main points in relation to each incident, including, where available, details of force size at the time of the disaster, number of officers involved in the deployment, and relevant experience at the time. Details of the disaster follow, as well as the recovery and identification methods employed, the number of fatalities and casualties, and lessons learned. The effects on the force and community, both contemporary and long-term, are discussed in detail. Finally, present-day developments in relation to that event are explored. A summary of the important aspects of the particular disaster is provided, in terms of legislative, moral, practical, or other contribution to the field of mass disaster planning, preparation, and deployment on a wider scale.

This text will consider only MFIs that have occurred within UK borders. While it is recognized that many British citizens have lost their lives abroad in mass fatality events, such incidents will not be discussed here, although they may form part of subsequent texts in this series.

The incidents detailed in this book cover a range of different types of events with varying numbers of victims and include train crashes, terrorist attacks, and football stadium disasters. Each incident was selected to highlight specific lessons learned and to illustrate the journey taken by disaster victim identification in the United Kingdom, including procedural, documentary, and emotional learning curves. Chapters 2–12 and 14–16 inclusive discuss a single incident in isolation. Chapter 13 is less of a discussion of the train crashes it covers and more of an analysis of policing experiences

Table 1.1 ACPO and ACPOS Territorial Policing Regions and Force Names

Region Name	Force Number	Force Name
Southwest (SW)	1	Devon & Cornwall Constabulary
	2	Avon & Somerset Constabulary
	3	Dorset Police
	4	Gloucestershire Constabulary
	5	Wiltshire Constabulary
Southeast (SE)	6	Hampshire Constabulary
	7	Thames Valley Police
	8	Surrey Police
	9	Sussex Police
	10	Kent Police
London	11	City of London Police
	12	Metropolitan Police Service
East (E)	13	Bedfordshire Police
	14	Hertfordshire Police
	15	Essex Police
	16	Cambridgeshire Constabulary
	17	Suffolk Constabulary
	18	Norfolk Constabulary
West Midlands (WM)	19	West Mercia Police
	20	Wiltshire Constabulary
	21	West Midlands Police
	22	Staffordshire Police
	23	Northamptonshire Police
East Midlands (EM)	24	Leicestershire Constabulary
	25	Derbyshire Police
	26	Nottinghamshire Police
	27	Lincolnshire Police
	28	Cheshire Constabulary
Northwest (NW)	29	Merseyside Police
	30	Greater Manchester Police
	31	Lancashire Constabulary
	32	Cumbria Constabulary
	33	South Yorkshire Police
Northeast (NE)	34	West Yorkshire Police
	35	Humberside Police
	36	North Yorkshire Police
	37	Cleveland Police
	38	Durham Constabulary
	39	Northumbria Police

Continued

Table 1.1 (Continued) ACPO and ACPOS Territorial Policing Regions and Force Names

Region Name	Force Number	Force Name
Wales	40	Dyfed-Powys Police
	41	South Wales Police
	42	Gwent Police
	43	North Wales Police
Scotland	44	Dumfries and Galloway Police
	45	Strathclyde Police
	46	Lothian and Borders Police
	47	Central Scotland Police
	48	Fife Constabulary
	49	Tayside Police
	50	Northern Constabulary
	51	Grampian Police
Northern Ireland	52	Police Service of Northern Ireland



Figure 1.3 The 11 ACPO and ACPOS geographical policing regions for the United Kingdom and the primary force area for each incident (or four incidents for Chapter 13) represented by chapter number.

and the ways DVI developed as a result of one specific type of event. Table 1.2 summarizes each incident in chronological order, including chapter number, incident name, details of the primary responding force, and date of the incident and number of deceased victims.

Table 1.2 Disasters Covered in Chronological Chapter Order, with Dates, Responding Force, and Number of Deceased Victims

Chapter	Incident	Responding Force	Date	Deceased
2	The Aberfan Colliery Disaster	South Wales	October 21, 1966	144
3	The Brighton Hotel Bombing	Sussex	October 12, 1984	5
4	The Bradford City Football Stadium Fire	West Yorkshire Met.	May 11, 1985	56
5	Manchester International Airport Fire—Flight KT28M	Greater Manchester	August 22, 1985	55
6	King’s Cross Underground Fire	Metropolitan Police Service	November 18, 1987	31
7	Piper Alpha Oil & Gas Platform Disaster	Grampian	July 6, 1988	167
8	The Lockerbie Bombing	Dumfries & Galloway	December 21, 1988	270
9	The Hillsborough Football Stadium Disaster	South Yorkshire	April 15, 1989	96
10	The Marchioness Pleasure Boat Disaster	Metropolitan Police Service	August 20, 1989	51
11	The Dunblane Primary School Shootings	Central Scotland	March 13, 1996	17 + 1 suicide = 18
12	The Omagh Bombing	Royal Ulster Const. (now Police Service of Northern Ireland)	August 15, 1998	29
13	Rail Incidents			
	1. Paddington Rail Crash	Thames Valley	October 5, 1999	31
	2. Hatfield Train Derailment	Hertfordshire	October 17, 2000	4
	3. Selby Rail Crash	North Yorkshire	February 28, 2001	10
	4. Potters Bar Rail Incident	Hertfordshire	May 10, 2002	7

Continued

Table 1.2 Disasters Covered in Chronological Chapter Order, with Dates, Responding Force, and Number of Deceased Victims

Chapter	Incident	Responding Force	Date	Deceased
14	Chinese Lorry Deaths, Dover	Kent	June 18, 2000	58
15	Morecombe Bay Cockling Disaster	Lancashire	February 5, 2004	23
16	London Bus and Underground Bombings	Metropolitan Police Service	July 7, 2005	52 + 4 suicides = 56

Reference

UK DVI; The Practitioner’s Guide by Black, S., Walker, G., Hackman, L. and Brooks, C. 2010. The Practitioner’s Guide. Dundee University Press, Dundee, Scotland.

The Aberfan Colliery Disaster, October 21, 1966

2

MARK LYNCH
SUE BLACK

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Introduction

The mining community is no stranger to danger and loss of life—it is a perilous occupation. On many occasions the magnitude of the death toll has been staggering, most often through the effect of fire and explosion, as occurred at Senghennydd (1913) when 439 miners died or Gresford (1934) when 265 miners lost their lives. Yet none would ever compare with the social devastation, the national and international shock, and the enormity of support and indeed humanity that occurred as a result of the Aberfan disaster in the county of Merthyr Tydfil, in October 1966. The incident was under the jurisdiction of South Wales Police (Figure 2.1).

Aberfan was a small Welsh mining town of only 4,000 inhabitants, situated 5 miles south of Merthyr Tydfil and 25 miles northwest of Cardiff. The town had grown to accommodate the family needs of the mining community following the sinking of the first pit in 1869 by a private mining company, although the mines would ultimately be nationalized in 1947 when the National Coal Board (NCB) took ownership of the industry.

Aberfan sits in one of the 12 valleys that straddle the South Wales coalfields; overlooking the town were the seven colliery spoil tips for Merthyr Vale Colliery. For nearly 50 years, millions of cubic meters of excavated mining debris were deposited on the side of Merthyr Mountain, directly above the village of Aberfan. These monstrous piles of loose rock and mining slag had been dumped on top of a layer of highly porous sandstone that contained many underground springs. Indeed, tip number 7 had been built



Figure 2.1 Policing regions of Wales with South Wales Police boundaries highlighted.

directly over one of these springs when it was begun in 1958 and had been the source of a number of relatively minor slips prior to 1966. This tip was different from the others, however; it was largely composed of “tailings.” These minute particles of coal and ash residue remain after completion of the filtration process, and when this fine dust is mixed with water it takes on the consistency of quicksand. Although local authorities had raised specific concerns in 1963 about slag being tipped on the mountain above the village primary school, these were largely ignored by the area management of the NCB.

Circumstances

On the week that commenced with October 17, 1966, there had been quite heavy rain in the area of Aberfan, and this is always a dangerous time for the stability of colliery tips and slag heaps. However, the threat level was increased as the underground water table had also risen and the spring under the tip was swollen from the rain of the previous 2 days. That the tip was built on the site of an underground spring, given the threat level, was just asking for trouble, but the NCB would ultimately deny that it knew of the spring's existence, despite it being clearly marked on the ordnance survey map of 1919 and on a geological survey map of 1959.

Leslie Davies, the tip gang charge-hand, informed the subsequent disaster inquiry that on the day of the tragedy he had told Vivian Thomas (colliery mechanical engineer) that number 7 tip was sinking and had shifted by approximately 6 meters. Thomas told him to get the crane back as far as he could from the tip and start another tip site later in the week. Davies decided

that before they would start they would have a tea break, and everyone retired to their shack. They had barely been in there for 5 minutes when the unstoppable disaster commenced: At 9:15 a.m. on Friday, October 21, 1966, the spoil experienced a small rotational slip and began to move.

As it gathered momentum downhill, the noise was likened to a jet engine, and the miners who witnessed the moving mountain of black sludge were powerless to intervene. They tried to raise the alarm but were thwarted as the telephone cables had been severed and stolen. Half a ton of tailings started to move, which caused much of the colliery tip to shift, culminating in a wave over 12 meters high and 7 meters wide traveling at speed down the valley. As it picked up momentum, it uprooted trees, engulfed hillside cottages and farms, killed livestock, sucked up boulders, vehicles, and masonry, and ultimately traversed the Glamorgan canal and railway embankment, but not before rupturing a mains water supply that lubricated the slurry further and accelerated its descent down the valley toward the town of Aberfan. It roared down Moy Road, smashing into a row of eight terraced houses and forcing them back into another adjacent row of six houses behind, before it finally lost its momentum on collision with the back of Pantglas Infant and Junior School. The school was buried under approximately 6–9 meters of debris.

This was the last day of school for the children before half-term, and they had just returned from assembly and settled down to their studies. The teachers talked about hearing a roaring noise, and some, thinking a plane was about to crash, instructed their pupils to take cover under their desks. The black sea of muck crashed into the school, pouring in through the doors and the windows and burying all in its path.

Gareth Groves, a pupil from the school, described how “I saw a tree and a telegraph pole coming towards me first, then I saw a big black mass of stuff. ... A black wave of muck” (Mclean and Johnes, 1999). Jeff Edwards, also a pupil from the school, said 30 years later “The desk was jammed into my stomach and my leg was under a radiator. The little girl next to me was dead and her head was on my shoulder” (*ibid.*). At the same time Susan Robertson recalled, “My abiding memory of that day is blackness and dark. I was buried by this horrible slurry and I am afraid of the dark to this day” (*ibid.*) (Figure 2.2).

The disaster that befell Aberfan on October 21, 1966, was to be indelibly imprinted on the British memory and to become a defining moment not only in mining but also in Welsh history. In total, 144 people died as a result of the disaster, 116 of whom were children under the age of 11—almost half the school register. Of the 28 adults who lost their lives, 6 were school staff. The senior school was largely spared as it started its school day later than the primary pupils.

The first emergency call was received by Merthyr Tydfil Police from a bystander at 9:25 a.m. who called it in from the Mackintosh Hotel and stated,

"I have been asked to inform that there has been a landslide at Pantglas. The tip has come down on the school." By 9:47 a.m. Merthyr Police had informed Glamorgan Head Quarters that "the school is flattened. ... There are about 200 children inside" (McLean and Johnes, 1999).

Chief Constable Griffiths of the County Borough of Merthyr Tydfil reached the incident by 10:00 a.m., and set up an incident post at a police car on the colliery side to maintain communication with headquarters via radio telephone. The three police areas of Merthyr Tydfil, Glamorgan, and Cardiff worked together on this disaster under the lead of Superintendent John Parkman, head of the regional crime squad.

The sirens were raised, and all miners in the area grabbed their tools and raced to the school. They came up from the pits with their lamps still on; others arose from their beds, having just finished the night shift, and ran. They arrived at the school to find women, men, teachers, and all other by-standers digging at the slurry with their bare hands until their skin was ripped raw. They swiftly took efficient charge and dug with a fury to find survivors (Figure 2.2). The roads quickly became blocked by those who, upon hearing the news, had raced in their cars to the scene to help, impeding movement of emergency vehicles. By 10:30 that day the BBC was broadcasting live footage of the disaster to the country and the rest of the world. This was the first ever mass disaster to be broadcast live, and as a result onlookers and press flooded to the area. One rescue worker remembers, "I was helping to dig the children out when I heard a photographer tell a kiddie to cry for her dead friends, so that he could get a good picture—that taught me silence" (McLean and Johnes, 1999). Several hundred workers were trying to rescue survivors, and by Saturday the number had swelled to over 2,000, many of whom had been working without a break for a full 24 hours (Figure 2.3). Although many survived the disaster, nobody was brought out alive after 11:00 a.m. on Friday. It was nearly a full week before the last body was recovered.

Identification

The operation then moved from a search and rescue (SAR) format to one of body recovery and victim identification. Police were organized into teams of eight that provided full 24-hour coverage in 6-hour shifts. Only 32 officers formed this disaster team (15 from Glamorgan and 17 from the borough of Merthyr Tydfil), which was responsible for scene management, crowd control, and mortuary duties, for organizing a water supply to the area, for overseeing telephone and communications connections, as well as fulfilling administrative duties.

A medical reception was quickly set up in the Bethania Chapel, which was ideally placed only 250 yards from the school; however, due to the speed



Figure 2.2 Sergeant Jones carrying Susan Robertson out of Pantglas Junior School. (Photo courtesy of Rex Features.)

with which bodies were being removed from the scene, it quickly turned into a temporary mortuary. By 11:30 p.m. on Friday, the chapel had received 67 bodies, and by 6:00 a.m. the following day the death toll had risen to just over 100. The vestry of the chapel became a base for the army of voluntary workers (Red Cross, St. John Ambulance, and Salvation Army) as well as a store for over 200 coffins that arrived from all over the country. Detective Constable Bob Evans remembered, “You couldn’t walk 5 yards without a member of the WRVS [Women’s Royal Voluntary Service] or the Salvation Army or the Red Cross putting a cup of soup, a cup of coffee or a cup of chocolate into your hand” (McLean and Johnes, 1999). The desire and need to assist was ferocious.

The vestry of the chapel also became the Missing Persons’ Bureau, where families would come to look for their children in the hope that they would not find them. It became a coordination center for liaison between those who had been removed to the nearby hospitals and those who were survivors,



Figure 2.3 Firefighters and miners search amid the rubble to find survivors of the disaster. (Photo courtesy of Rex Features.)

as well as for families who could not find their loved one in either of those categories. The coroner, Ben Hamilton, and his officer worked with two local doctors to certify the deaths, and also with the surviving school teachers to piece together a register of the pupils in the school and to determine which classes were most likely affected.

The smaller Aberfan Calvinistic Chapel (about 50 yards from Bethania) was set up as a second area to be used after the identifications had been confirmed and prior to the bodies being released for internment. Two days after the event a veritable army of embalmers arrived to clean, dress, and encoffin the bodies prior to their release. Bodies started to be released for burial on Monday, October 24.

When a body was pulled from the site, it was transferred by stretcher bearers from St. John Ambulance to the Bethania Chapel. As each body was booked into the mortuary, it was assigned a unique reference number (URN) that was pinned to the clothing by a police officer. That body label did not leave the body at any time, and it was cross-referenced to a card index system held in the administrative center in the vestry of the chapel. A note was made of whether the body was male or female, adult or child, thereby forming a rudimentary biological profile. Each body was laid out on one of the pews in the chapel and covered by a blanket. The number of bodies quickly escalated, and the workers had to resort to placing stretchers between the pews. At the same time, the room was reorganized so that boys were on one side and girls on the other.

Families remained outside the chapel in a silent orderly queue waiting to be allowed access to attempt to identify their loved ones. Three surviving teachers helped with the identifications, and a mortuary assistant washed the children's faces because identification was largely undertaken by visual means. Families waited patiently for hours, afraid to go home in case they should lose their position in the queue. Only one family was allowed into the chapel at a time, and on entering they would inform the officer whether they were looking for a girl, a boy, an adult, or a child. They would then be taken to the appropriate sector of the chapel, and each of the blankets would be lifted in turn until they were able to recognize their loved one. Identification was often supported by clothing or personal belongings, but as one police officer commented, "Most of the boys wore grey short trousers and the girls a standard dress and cardigan" (McLean and Johnes, 1999).

Identification proved to be difficult for only 15 of the bodies due to their injuries and four cases involving fragmented limbs, one of which was identified by a cobbler for the work undertaken recently on the victim's shoe. Fingerprints were taken, although they were not used as the remainder of the bodies were finally identified through recourse to records kept by the school dentist, Frank Baguley.

Inquests were held in the chapel by the coroner in the presence of a police officer, a doctor, and his coroner's officer once identification had been confirmed. Causes of death were primarily listed as asphyxia, skull fracture, or multiple crush injuries, but no postmortems were undertaken. Notification of each inquest was attached to the chapel door. At the subsequent hearing into the disaster when these causes of death were read out, a bereaved father rose to his feet and said, "No, Sir, buried alive by the Coal Board" (McLean and Johnes, 1999).

Once all bodies had been identified, some inquiries were made regarding any other possible missing persons. This was undertaken through house-to-house searches, and an inspection of school records was performed in relation to the list of victims and survivors, electoral registers were checked, health lists were examined, and the local churches were consulted to see if they were aware of any missing persons not yet accounted for. Satisfied that this was not the case, the matter of the funeral arrangements for the 144 victims of the Aberfan disaster remained to be agreed. Many of the villagers wished there to be a massed burial in the local cemetery, and this occurred 6 days after the event on October 27.

The event was televised, which led to global support for the little village of Aberfan and a disaster fund was set up. This raised the almost unimaginable sum of £1,750,000 with contributors' sentiments ranging from "Never before have we paid for our coal with the lives of children and we must never do so again" to a simple statement, "Please find inside some money that I was saving to buy a new coat, I just wish I had saved for a more expensive one"

(McLean and Johnes, 1999). While the surviving children of Aberfan may have experienced a somewhat more lavish Christmas than usual that year, it was severely marred with the guilt of survival, something from which many would never recover. The Coal Board refused to pay for the cleanup and removal of the slag heap, and this was scandalously met from the disaster fund. It took until August 1997 for the £150,000 to be repaid into the fund by Ron Davies (Labour), then secretary of state for Wales. It was suggested that with the inflation the repayment should really have been in the region of £1.5 million.

After the Event

Tensions ran high in the South Wales coal fields as the Coal Board took responsibility neither for the disaster nor for the prevention of future events. The NCB chair, Lord Robens of Woldingham, did not even attend the scene immediately but rather chose to proceed with his installation as chancellor of the University of Surrey. For this, he was met with public derision and local contempt. The Wilson government was pressured by the public to hold the first public inquiry of its kind. The tribunal was appointed by the secretary of state for Wales, Cledwyn Hughes, and chaired by Welsh Barrister and Privy Councillor Lord Justice Sir Edmund Davies. It sat for 76 days, heard 136 witnesses, and examined over 300 exhibits. While the Coal Board was ordered to pay compensation of £500 per child for the loss of life, no single person was held accountable, and nobody lost his job, was demoted, or prosecuted. “Blame for the disaster rests upon the National Coal Board—The legal liability of the National Coal Board to pay compensation for the personal injuries (fatal or otherwise) and damage to property is incontestable and uncontested” (Hughes, 1967). The only positive outcome was that it resulted in a piece of legislation: the Mines and Quarries Tips Act of 1969 (Health and Safety Executive, 1969). This act was passed to help protect public safety and prevent such an event from happening again.

Conclusion

Pantglas School was demolished, and a garden now occupies the site of one of the saddest and eminently preventable disasters on UK soil. Many of the survivors who are now mature adults still suffer what we would recognize as posttraumatic stress disorder (PTSD) over 40 years later. Of the 86 children seen by one psychiatrist, it was assessed that 55 had moderately severe symptoms, but, of the 83 adults examined, over 90% exhibited severe symptoms of PTSD. However, a small mining village in South Wales during the 1960s had little time for counseling and debate; rather, in true working-

class style, they suppressed their emotions and simply “got on” with their lives.

While the immediacy of a disaster is focused rightly on survivors and then body recovery, the legacy of a disaster lives on for as long as there are survivors to remember or a society that cares.

References

- Health and Safety Executive (1969). Mines and Quarries (Tips) Act 1969. Available from the Stationary Office, <http://www.hse.gov.uk/mining/legislatlist.htm> (accessed May 6, 2010).
- Hughes, C. (1967). *Report of the Tribunal Appointed to Inquire into the Disaster at Aberfan on October 21st, 1966*. London: HMSO.
- Mclean, I. & Johnes, M. (1999). The Aberfan Disaster. Available from <http://www.nuff.ox.ac/politics/aberfan/home2.htm> (accessed May 7, 2010).

The Brighton Hotel Bombing, October 12, 1984

3

ANDREW BUCHAN

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Introduction

“My Lords, I cannot express too profoundly my admiration of the courage, dedication and selfless devotion to duty shown by the Police, the Fire and Ambulance Services, the hospital staff and all those involved in those difficult and dangerous hours immediately after the explosion occurred.” Statement by Lord Whitelaw to the House of Lords, October 16, 1984

The annual Conservative Party Conference took place at the Grand Hotel, Brighton, from October 9–12, 1984. Code named Operation Leyton, the police response to the conference commenced 2 weeks prior to the conference and cost over £2 million. At 2:54 a.m. on October 12, a 20-pound bomb exploded, which had been hidden days before by the Irish Republican Army (IRA) in a room on the sixth floor of the hotel. In total, 260 people were in the hotel at the time of the explosion and included the prime minister and her cabinet. Five people lost their lives, and many more were seriously injured.

Background

From the Easter uprising in 1916, the IRA became one of the preeminent terrorist organizations in the world. The IRA typified the ideology of third-wave terrorist groups, namely, those with sovereignty and ideological grievances

with forces occupying valued lands. The IRA embarked on one of the most enduring terror campaigns in history, one that continues today through the reemergence of dissident groups such as the Real and Continuity groups (Rapoport, 2006).

In 1969, the IRA split into the Official IRA and the Provisional IRA. Both organizations opposed partition and refused to recognize the governments of either the Republic of Ireland or Northern Ireland. The Official IRA adopted a defensive strategy, preferring to pursue a policy of creating a socialist Ireland by largely peaceful means, whereas the Provisionals advocated violent confrontation (English, 2003). Between 1969 and the Provisional's declaration of a permanent end to their "armed struggle" in July 2005, the group had killed more than 1,800 people. It is against this violent backdrop that the IRA undertook one of its most audacious attacks, targeting the British prime minister and her cabinet at the 1984 Conservative Party Conference in Brighton.

The 1970s were the bloodiest years of the conflict (Coogan, 1987): Most notably, the Bloody Sunday riots in January 1972 gave way to the hunger strikers of the 1980s, epitomized by Republican Bobby Sands, who died in the Maze Prison in 1981 following a 66-day hunger strike (*ibid.*). Set against this threat and a background of unrest, demonstrations, and protest, Sussex Police (Figure 3.1) planned and prepared for the 1984 Conservative Conference to be held at the Brighton Centre October 9–12, 1984 (Sussex Police, 2005). Brighton had a long history of hosting political party conferences. Sussex Police were similarly well versed in conference policing and had planned, secured, and policed the Trades Union Conference earlier that year. The conference had acted as a magnet for mass protests at what was considered to be class-based and punitive economic policies.

Circumstances

Operation Leyton, the police response to the conference, commenced 2 weeks before the delegates arrived and included searching the conference venue and establishing police cordon points. The policing operation, costing over £500,000, drew heavily on Sussex Police resources. Of the 2,800 officers who policed East and West Sussex in 1984, 1,000 were engaged in Operation Leyton. The conference started and continued with minimal disruption until 2:54 a.m. October 12, 1984. The explosion and precise timing was captured on a police surveillance camera installed for the conference (Figure 3.2).

The device had been hidden behind the bath panel in the bathroom of Room 629. The iconic images of the bomb-damaged façade of the Grand Hotel testify to the destruction that was caused (Figure 3.3). The explosion

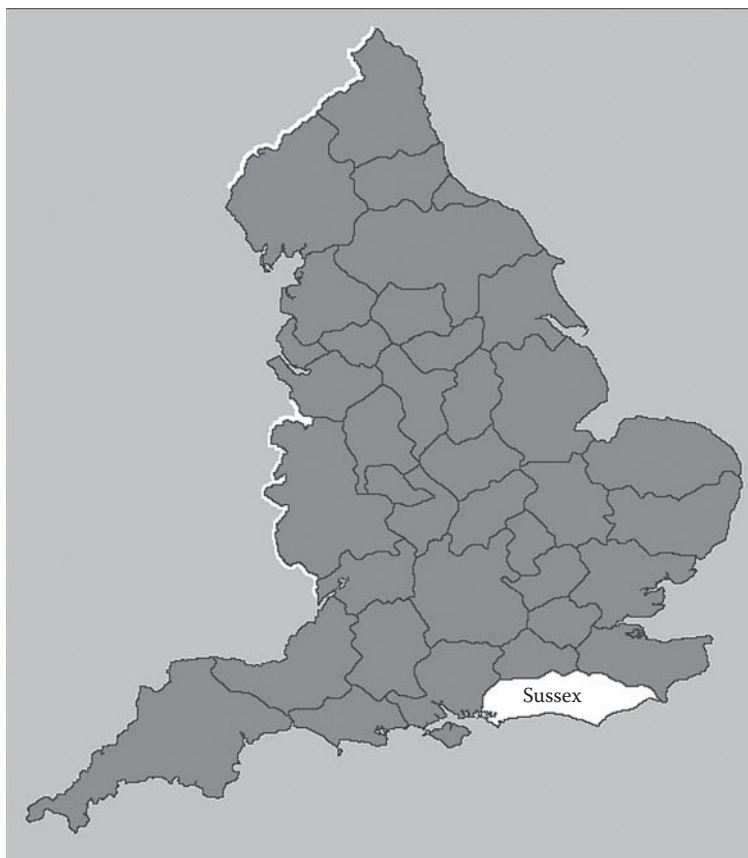


Figure 3.1 Policing regions of England with Sussex Police boundaries highlighted.

destroyed Rooms 629 and 628. All the rooms below collapsed to basement level (Birch, 1985a, 1985b).

With a standing police commitment of 20 officers at the scene, the response to the explosion was instantaneous. Within an hour, an inner cordon was established around the Brighton Centre and the Grand Hotel. It required 115 officers to sustain the cordon that remained in place until October 23, 1984, when site clearance was complete. Police supported the 20 fire crews that conducted a meticulous search and rescue (SAR) operation in an unsound structural environment. By 5:00 a.m. the majority of the casualties had been recovered. Those trapped by falling debris were then removed with John Wakeham, then Conservative Party chief whip, being the last to be recovered at 10:16 a.m. (Birch, 1985a).

The initial imperative was to save lives. This phase of the operation drew parallels with similar operations conducted today. In an interview with



Figure 3.2 Bomb damaged façade of the Grand Hotel, Brighton. (Photo courtesy of Sussex Police.)



Figure 3.3 The rendezvous point for emergency services—too close to the scene. (Photo courtesy of Sussex Police.)

police review after the incident, Chief Constable Roger Birch said, “When we arrived at the Grand, although it appeared chaotic, my inward feeling of panic disappeared. Obviously our contingency plans were working well: the police, fire and ambulance services working as one: the joint exercises we held had proved their worth” (Hilliard, 1985, p. 215).

Detective Inspector Neil Fellingham, then a police constable based at Littlehampton, was on point duty outside the hotel during the evening of October 11, 1984. Together with a colleague, Fellingham took up a point in the lobby and started to check the identities of people coming in to the Grand Hotel. Until he went off duty at 1:30 a.m., Fellingham oversaw the movement of people entering and exiting the Grand Hotel; he recalled that one member of parliament (MP), who was unable to prove his identity, was denied access despite using that most hackneyed of lines: “Don’t you know who I am” (Fellingham, 2009). Fellingham’s attention to duty possibly saved the MP’s life.

Following the explosion, Fellingham and his colleagues were immediately recalled to duty and set up a cordon in the aftermath of the explosion. He recalled an air of “managed chaos” as the SAR teams, led by the fire brigade, sifted through the rubble in search of survivors. The initial response was further complicated by the security arrangements required at multiple sites. Prominent politicians of the day together with officials needed enhanced security following the bomb, and at its peak this task alone required 45 police officers. Police guards remained at the Royal Sussex County Hospital until December 3, 1984, when the last patient, Wakeham, was discharged. The explosion had generated another priority for the initial responders: The scene was strewn with confidential government material. Not catered for in the initial plan, a police and cabinet office team was set up to recover and audit the papers at Brighton Police Station.

Response

The criminal investigation started immediately after the explosion. Examination of the scene was the key priority, and a team of computer experts from Essex Police used the new computerized major incident room indexing and management system. The Sussex team of 20 detectives was soon augmented by a team of officers from the Metropolitan Police Service Anti-Terrorist Branch. At its peak the outside inquiry team reached 112 officers.

By December 1984 the investigation had raised 7,250 actions, and 4,274 statements had been taken. The most significant lead was the discovery of a hotel registration card completed in the name of Roy Walsh. Three months after the explosion, fingerprints from the registration card identified Patrick McGee, a known IRA terrorist, as the principal suspect in the inquiry.

Further investigations pieced together McGee's movements in the months leading up to the conference. Incognito, he had visited Brighton and stayed at the Grand Hotel from September 15–17, 1984, when he planted the bomb, 4 weeks before the conference.

The first area not consistent with current disaster victim identification (DVI) doctrine and standards was the location of the forward rendezvous point (RVP). This was too close to the scene and conflicted with concerns over the placement of secondary devices as evident in the recent attacks on the Tiger Tiger bar in London in 2008 (Lashmar and Moreton, 2007). Second, the attention to forensic retrieval by search teams had been only partially considered. No provision had been made in the operational order for the recovery, storage, processing, and subsequent identification of survivors or victims. Dr. Iain West, a Home Office pathologist, was present at the scene and was able to assist with the recovery and repatriation (Anscombe, 2001). No forward body holding area was established for body recovery or the storage of bodies and body parts before being taken to the mortuary (Figure 3.4). Although this is a clear omission, the pace of recovery of the four people who died at the scene enabled the bodies to be individually recovered to the Brighton Borough Mortuary where postmortem examinations were undertaken by Dr. West.



Figure 3.4 Search and rescue and body recovery operation. (Photo courtesy of Sussex Police.)

Identification

As both an open and closed incident—only a limited-named manifest of possible victims was available—the challenge of identification was straightforward in all but one case. The first three bodies were visually identified at the scene by friends and relatives, themselves caught in the incident. These identifications were made to Dr. West in the presence of the police, who provided continuity by escorting the body to the mortuary. Eric Taylor, Mrs. Wakeham, and Sir Anthony Berry were confirmed dead at the scene by Dr. West, who during postmortem examinations the following day recorded the cause of death as traumatic asphyxia following explosion (HM Coroner Reports, 1985).

Taylor, a marketing manager from Oldham, had attended the conference with his wife, Jennifer. At the time of the explosion, the couple were asleep in Room 528. In one of those remarkable, random, and tragic twists of fate, Mrs. Taylor was taken to the hospital suffering from cuts and bruises, whereas her husband's body was recovered from the rubble. Taylor was identified by MP David Tripper, a family friend. This identification was corroborated by the recovery of a gold chain and St. Christopher's medallion which was identified by his wife.

Mrs. Wakeham had attended the conference with her husband, John. The couple were asleep in Room 428 when the bomb went off. Having fallen through four floors, the couple spent some time under the rubble. In his statement, Wakeham recalls talking to his wife before they were both recovered by the Fire Brigade. He was taken to the nearby Royal Sussex County Hospital (RSCH) having sustained a number of leg injuries and was released from hospital a few weeks later. Unfortunately, Mrs. Wakeham was pronounced dead at the scene and was initially identified by MP David Waddington and later by John Cope, a longstanding family friend.

Sir Anthony Berry, the deputy chief whip of the Conservative Party, had been with his wife in Room 328 when the bomb exploded. Sir Anthony was pronounced dead at the scene. His wife was recovered from the debris 3 hours after her husband and was taken to the RSCH, where she was released later that week. Waddington again visually identified Sir Anthony at the scene.

The fourth victim found dead at the scene, Jeanne Shattock, was recovered from Room 628, the bedroom next to the one in which the bomb was planted. Her body had been decapitated and severely disrupted. The postmortem was completed on October 15, 1984, and confirmed the cause of death as multiple injuries following explosion. Mrs. Shattock had sustained multiple puncture wounds and complete fragmentation of the skull. The coroner's report confirmed that identification had been made by comparing

fingerprints taken from the body to those recovered from the family home. Postmortem dental records matched antemortem records produced by the family dentist, Wilfred Selly, and comparisons of jewelry recovered from the body matched family records (HM Coroner Reports, 1985).

The fifth and final fatality was Muriel McLean, who had been staying in Room 629 and had been injured in the blast and taken to the RSCH. Despite extensive surgery including amputation of her right leg, Mrs. McLean died on November 14, 1984. The cause of her death was confirmed as bronchopneumonia and renal failure following injuries.

After the Incident

Having opened the inquest on October 15, 1984, Coroner Edward Grace considered all the evidence at the hearing on April 17, 1985. He concluded that, in five cases, death had been caused as a direct result of the bomb exploding in Room 629 at 2:54 a.m. October 12, 1984. In each case the coroner returned a verdict of unlawful killing.

Set against today's process, it is evident that an identification commission was not held. However, the coroner's notes record a series of meetings among the police, the pathologist, and the coroner, at which the progress of the investigation was discussed, particularly as potential evidence had to be secured from each body to ascertain the origins of the device.

Notwithstanding the weakness of visual identification, this was, in part at least, a closed incident. This, added to the fact that three of the bodies were not disrupted, would support the reliance on visual identification. For completeness these identifications should have been supported by a primary identification method (i.e., fingerprints, DNA, odontology, or unique medical condition). The identification of Mrs. Shattock would resonate with current standards with two primary identification sources—fingerprints and dental records—and a secondary in the form of identifiable jewelry. The identification of Mr. Taylor was also supported by a secondary identification source, a personal effect.

Limited information is available on the establishment, performance, and operating parameters of the casualty bureau. In his report to Sussex Police Authority on January 23, 1985, Birch stated that a casualty bureau had been established. At its peak the bureau employed 31 people providing round-the-clock service until it was closed on October 30, 1984 (Birch, 1985a, 1985b).

Within a few hours of the explosion, Birch commissioned an independent review undertaken by Deputy Chief Constable John Hoddinott from Hampshire Police. With wide-ranging terms of reference, the review's findings shaped the future of conference policing that escalated the scale of subsequent policing operations. P.C. Fellingham was interviewed as part of the

review (Fellingham, 2009); he recalled that the focus was primarily centered around the security arrangements and briefings. In particular, he was questioned regarding his unilateral decision to start to challenge people seeking entry to the hotel. The review also heralded the establishment of the Police National Search Centre, creating a center of excellence to assist operational commanders in commissioning and undertaking a variety of search tactics. The review was debated in both Houses of Parliament but made little reference to body recovery. In an accompanying letter, Hoddinott stated, "The bravery of some of your officers in their rescue attempts was of the highest standard and should be drawn to your attention" (Birch, 1985b).

Since the Grand Hotel bombing in 1984, Brighton has hosted many political and government conferences. The Conservative Government returned to Brighton in 1988 with many victims stoically returning to the Grand Hotel. The IRA also returned to Brighton in 1994 with the planting of a bicycle bomb as part of their final campaign on the UK mainland (Bennetto and Murdoch, 1996). Following the Hoddinott Report, successive conferences comprised a substantial security operation with an extensive preconference search phase. However, little had changed in planning for disaster and the recovery of casualties.

Conclusion

Subsequent police operational orders, nationally bench tested, have been similarly scant in the provisions for DVI. Typical of these was the 2005 Operation Otter order, detailing the policing response to the Conservative Party Conference. The order makes brief mention of a temporary mortuary at Brighton City Mortuary and provisions for the casualty bureau at police headquarters, exactly the same as in 1984. No provision was made for a senior identification manager (SIM), body recovery, and postmortem teams (Sussex Police, 2005).

Conference policing changed significantly in the aftermath of the Grand Hotel bombing, however, the Hoddinott review was the catalyst for the substantial security operations that surround political conferences today. In Sussex, DVI had not featured in the policing plans that governed subsequent conferences in Brighton despite the devastating impact of the bomb. However, 25 years later, the 2009 Conservative Party conference in Brighton, ironically conducted against a backdrop of harsh economics, an omnipresent terrorist threat, and resurgent Irish republicanism, was the first policing operation to contain an integrated and exercised DVI element.

The Grand Hotel bombing has, therefore, been a Rubicon for policing in many aspects. Conference policing and searching have developed from the lessons learned. Similarly intelligence handling and the role of special

branches came under intense scrutiny. The initial SAR operation was conducted effectively and to a standard that would withstand scrutiny against modern doctrine. Gaps in forensic awareness, typical of the period, would not be evident today in the recovery of bodies from the scene of a mass fatality incident. The use of primary and secondary identification methods accord with best practice today, although sole reliance on visual identification would not be acceptable. Unfortunately, the explosion and the subsequent Hoddinott Report did not highlight areas of development for DVI, due in part to the focus of the review. Notwithstanding the excellent work of all first responders and staff, the review dealt only with body recovery with a light touch.

As for Sussex Police, it is only recent national developments in DVI and an expanding UKDVI cadre within the force that identified the gap in DVI provision in the conference planning process. For the first time, DVI was exercised as part of the conference program and formed a central part of the 2009 Operation Otter plan. Set against the standards of the day, the police response to the explosion attracted praise from all quarters. The brave endeavors of the emergency services in conducting a SAR operation within a structurally unsound building would echo similar operations today. However, against existing standards and doctrine for DVI it is clear there were significant omissions in the operation.

McGee was arrested in Glasgow on June 22, 1985, and, following a trial at the Old Bailey in June 1986, was found guilty of murder and sentenced to eight consecutive life sentences. He was released from prison in 1999 under the terms of the Good Friday Agreement, having served 14 years. In a brave gesture of reconciliation Jo Berry, Sir Anthony's daughter, invited McGee to return to Brighton to commemorate the twenty-fifth anniversary of the bombing (Addley, 2009).

References

- Addley, E. (2009). Regret, but No Sorrow for Brighton Bomb. *The Guardian Online*. Available from <http://www.guardian.co.uk/politics/2009/oct/14/brighton-bomb-anniversary-magee> (accessed May 13, 2010).
- Anscombe, A. (2001). Iain West. His Brilliant Forensic Skills Unravelling IRA and Libyan Plots. *The Guardian Online*. Available from <http://www.guardian.co.uk/news/2001/aug/17/guardianobituaries1> (accessed May 13, 2010).
- Bennetto, J. & Murdoch, A. (1996). IRA Terror Suspect Questioned by Garda. *The Independent Online*. Available from <http://www.independent.co.uk/news/ira-terror-suspect-questioned-by-garda-1304517.html> (accessed May 17, 2010).

- Birch, R. (1985a). Terrorist Attack on the Grand Hotel, Brighton on October 12, 1984. A synopsis of a joint presentation by the Chief Constable of Sussex Mr. Roger Birch QPM, and the Deputy Chief Constable of Hampshire Mr. John Hoddinott MA, to a meeting of Assistant Chief Constables at Preston on March 8, 1985 and to a meeting of Chief Constables at the Police Staff College, Bramshill, in 1985.
- Birch, R. 1985b. The Terrorist Bomb Attack on the Grand Hotel, Brighton on October 12, 1984. Report by the Chief Constable to the Sussex Police Authority, January 23, 1985.
- Coogan, T. P. (1987). *The IRA*. London: Harper Collins.
- English, A. (2003). *Armed Struggle: History of the IRA*. London: Macmillan.
- Fellingham, N. (2009). *RE: Interview with DI Neil Fellingham, 07/12/2009*.
- Hilliard, B. (1985). Sir, We Have Bad News. *Police Review*, February 1, 1985.
- Her Majesty's (HM) Coroner Reports. (1985). Brighton and Hove Coroner Report. Ref SRN 84070, 197-200/85.
- Lashmar, P. & Moreton, C. (2007). The Hunt for the London Terrorists: Attempt May Show Change of Tactics. *The Independent Online*. Available from <http://www.independent.co.uk/news/uk/crime/the-hunt-for-the-london-terrorists-attempt-may-show-change-of-tactics-455475.html> (accessed May 17, 2010).
- Rapoport, D. C. (2006). Four Waves of Modern Terroism. Available from <http://homelandsecurity.tamu.edu/framework/enemies/terroismphilosophiesthinking/four-waves-of-modern-terroism.html> (accessed May 17, 2010).
- Sussex Police. (2005). Operation Otter: Brighton Party Conference Operational Plan.

Bradford City Football Stadium Fire, May 11, 1985

4

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Introduction

The Bradford City football stadium fire disaster was the largest incident ever investigated by the West Yorkshire Police (Figure 4.1), and it remains so today. On May 11, 1985, a fire raged through the crowded east stand at Bradford City’s Valley Parade football ground during the final game of the season. The fire moved at such an unprecedented speed that within 8 1/2 minutes the whole stand was completely engulfed. While many escaped the inferno, the fire resulted in the deaths of 56 individuals and more than 250 spectators were injured. Due to the presence of Yorkshire Television, this became a mass disaster viewed in real time by thousands of football fans, many of whom had relatives at the ground. The public inquiry that followed this disaster was led by Sir Justice Oliver Popplewell (1986)* and resulted in the introduction of legislation aimed at improving the safety of spectators at football grounds.

In May 1985, Bradford City Football Club was reaching the end of a very successful season. The team had won promotion to the next division and would be playing in Division Two (now Division One) the following season. It had also won the Third Division Championship and was to be presented with this trophy at the end of the match. Normal attendance for a home game was around 6,500 people; however, as a result of the popularity of this fixture

* In 1999, Popplewell donated the papers of the inquiry to the University of Bradford.



Figure 4.1 Policing regions of England with West Yorkshire Police boundaries highlighted.

as the last game of the season, the game on May 11 was attended by 10,973 fans (West Yorkshire Police, 1985)—representing approximately 170% of normal attendance.

The grounds are built on a slope of a valley side, having been completed in 1908. The stand that caught fire still retained the original timber structure, having changed little since an upgrade in 1911 (West Yorkshire Police, 1985). It was 90 meters long and provided a combination of seating and standing room for spectators. Access and egress for the stand was by turnstiles and gates, which were accessible only from the rear of the stadium as a result of being situated on the side of a hill. The turnstiles turned only in one direction, allowing fans into the ground but not out, and these were locked shortly after the beginning of the match. The gates through which the fans exited were, by tradition, kept locked until the second half of the match had commenced. Also located at the rear of the stadium were the toilets and snack bars (Figure 4.2).

The seating area was toward the rear of the stand and had capacity for 2,200 spectators; the seats in the front half were made of yellow polypropylene, whereas those in the back half were the original wooden type. The floorboards of this seating area were wooden, and the planks ran the length of the stadium. This flooring was not fitted, and there were gaps between the boards through which the void area underneath the stand could be seen. This void was never emptied and as a consequence had gradually filled with rubbish over the years, despite reports suggesting that the rubbish should be cleared for safety reasons; a search of this area after the fire revealed a buildup of rubbish, some of which dated to before 1971.

The front half of the stand, known as the paddock, comprised an area for 2,000 standing spectators. It consisted of a series of concrete steps separated from the pitch by a continuous retaining wall (Sivaloganathan and Green, 1989b). Due to the whole stadium being built into the side of a valley, the walls were of varying heights (West Yorkshire Police, 1985). Two walls stood 1.2 meters high on the spectators' side (Figure 4.2): the first was a continuous wall separating the spectators from the pitch, and the second separated the seats from the walkway at the rear of the stand. The height of these walls was to become an important factor to those who survived the blaze. Behind the separate VIP area the wall had been extended to ceiling height, thereby completely separating the VIP area from the shop and the toilets, and consequently forming a 12-meter ill-ventilated tunnel. The sloping floor and low

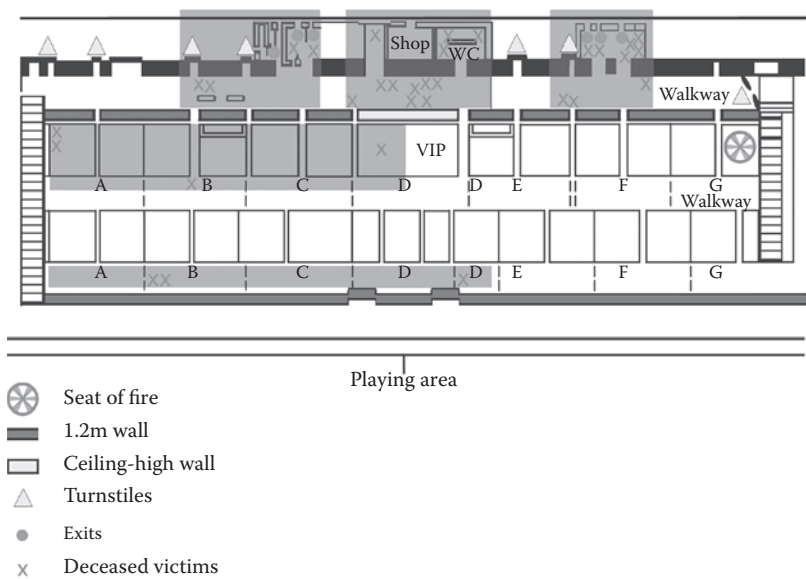


Figure 4.2 Schematic of the stadium showing the seat of the fire and locations of deceased victims. (Image courtesy of Sivaloganathan and Green, 1989a.)

ceiling resulted in a tunnel-effect, which would later cause smoke to concentrate at the rear of the stand (Sivaloganathan and Green, 1989a).

The stand was divided into two sections longitudinally by a fence approximately 1.5 meters high and subdivided into blocks from A to G, with the VIP area situated between blocks D and E. An isle divided each block, and two walkways ran the entire length of the stand—one at the rear and the other across the center of the seated tiers. The turnstiles were located to the rear of the walkway, near the toilets, etc., and emergency exits.

The whole area was covered by a wooden roof in the shape of an inverted “V,” which was in turn covered in asphalt. The roof was old and patched, and the club was aware that there were problems with it; the dangers of this and those associated with the rubbish that had accumulated in the void under the stand were highlighted in a number of health and safety reports prior to the incident. Bradford City Football Club had recognized that there was a problem with the roof, and contractors were standing by to replace it with a safer and more modern design once the season ended.

Circumstances

There were 142 police officers on duty at the Valley Parade Ground on the day of the fire (West Yorkshire Police, 1985). They describe their prematch briefing as concentrating mainly on crowd control; however, they were expecting little trouble from the fans who would be present, as Bradford City was not a club with a history of anything but minor transgressions from their fans. There was little in this police briefing covering health and safety or evacuation in the event of it becoming necessary, but this was normal for the time.

On the day of the match, 3,740 spectators crowded into the 90 meter long stand—separated into 1,993 fans in the seating areas and 1,747 in the paddock—to watch the final match of the season, which kicked off as expected at 3:00 p.m. It was not until almost the end of the first half of the game that any problems were noticed. Spectators in Block G (row I, seats 141–143) (West Yorkshire Police, 1985) near to the back of the stadium, realized that there was smoke and what appeared to be a small fire under their seats, within the void beneath the stadium (Figures 4.3 and 4.4). The flames themselves could be seen in the gaps between the floorboards, and the spectators could feel the heat under their shoes. A police officer was informed and in turn called for a fire extinguisher and at the same time requested that the rear exits to the stand be unlocked. This call was logged at 3:43 p.m. (*ibid.*). It was necessary for the extinguisher to be brought because none were available in the stand due to the risk of them being thrown during outbreaks of violence, although this was deemed unlikely. An officer tried to pry the floorboards up with his



Figure 4.3 The blaze began as a small fire, visible through the seats. (Photo courtesy of West Yorkshire Police.)



Figure 4.4 The fire as it began in the stand. (Photo courtesy of West Yorkshire Police.)



Figure 4.5 The fire as it began to increase in size. (Photo courtesy of West Yorkshire Police.)

truncheon but was unable to do so. Further calls for firefighting equipment were logged at 3:45 p.m., and the fire brigade was called for at 3:47 p.m.

The fire spread rapidly along the entire length of the stand to block A (55 meters) in under 4 minutes (Sivaloganathan and Green, 1989b). As the fire grew, officers began to try to move spectators away from the area and to clear the stand (Figures 4.5 and 4.6). Unfortunately, a number of problems



Figure 4.6 The fire takes hold. (Photo courtesy of West Yorkshire Police.)

hindered their attempts to do this successfully. Initially, there was a lack of comprehension about the seriousness of the situation from many spectators. At first, the only indication that there was a fire was the presence of smoke; most had no idea of the speed with which the fire would move once it took hold. In addition, the match continued on the pitch; it was not usual practice to stop a match when trouble broke out in the stands, and the referee had no way of knowing that this situation was any different from the normal type of disturbance that could occur at any match. In addition, people did not want to leave the stand while the match they had paid to see was still ongoing, especially when there did not seem to be much cause to move. Even if they had wanted to leave they were reluctant to exit via the front, which meant climbing the wall onto the pitch—with the game still ongoing this was tantamount to a pitch invasion, unthinkable for law-abiding fans. Finally, for many fans to exit via the front of the stadium they would have to have walked down past the seat of the fire, and most elected to take the more instinctive route, which took them back up and away from the fire toward the exits. The culminating result was that many fans made a deadly decision to move back up the stand to escape via the rear exits, not aware that they would be unable to exit the ground due to the gates still being locked (Figure 4.7).

Yorkshire Television was present at the match, and hence the fire was caught on film. Only when this film is viewed can a true appreciation be gained of how fast the fire moved and grew—from the discovery of the fire to the point at which the whole stand was ablaze (West Yorkshire Police, 1985). The design of the stadium acted to pull the fire upward while it was also spreading rapidly under the stadium within the void. It can be seen on the film that the flames from the fire spread most quickly upward into the roof, which quickly ignited, rather than along the seating. This film was later used by those investigating the disaster to evaluate the events of that day. The burning roof meant that molten asphalt began to drip on to those below and produced thick black smoke that was quickly sucked into the passageway at the rear of the stadium, where those who had not exited the stadium by the paddock at the front were trying to make their escape, an escape blocked by the locked gates. Those who survived the fire described the heat, which beat back many of those trying to rescue fans who were unable to make it over the 1.5 meter (5 foot) wall without assistance. It is estimated that temperatures within the stand reached 900°C, hot enough to melt man-made fabrics and cause people's hair to spontaneously combust.

The most successful exit during the incident was over the front wall of the paddock, and the majority of individuals who elected to go forward survived, with the exception of some who were less able to traverse the wall. This egress route was greatly facilitated by the absence of crowd containment fences, of the type then installed in many other football grounds (West Yorkshire Police, 1985).



Figure 4.7 The locked gates, preventing escape. (Photo courtesy of West Yorkshire Police.)

As the gates at the rear of the paddock remained locked throughout the entire incident, fewer individuals who elected to take this route survived. Of these, a number of fans were able to find ways out through a window or through small side gates reserved for staff, but these small exits were quickly lost in the smoke, which was so thick that it was impossible to see or breathe. Attempts were made to break doors and gates down from the outside as rescuers tried to reach those who had become trapped; however, except for one officer who managed to create an opening, they were unable to breach the heavy gates in time. Fire and ambulance crews responded to calls quickly, but by the time the first fire crews arrived on scene the fire had spread through the stand to such an extent that all they could do was assist in rescue and try to prevent the fire spreading to other parts of the stadium (Figure 4.8).

The ambulance crews were assisted by teams from St. John Ambulance, which were in attendance at the ground to give first aid. People were taken to the local Bradford Royal Infirmary (BRI) by whatever conveyance was available, and the hospital soon became overwhelmed. Here one of the advantages of televising the match became apparent as off-duty staff who had been



Figure 4.8 The blaze grew. (Photo courtesy of West Yorkshire Police.)

watching events unfold on the television made their way to the hospital, ambulance station, or stadium to assist in any way that they could. Estimates have suggested that over 200 casualties were dealt with at BRI in the 4–5 hours immediately postincident, with the overflow going to either St. Luke's or Bradford General and Batley General hospitals. Due to the speed with which events unfolded, it took some time before ambulances realized that BRI was at capacity and began bypassing it to use one of the other receiving hospitals.

The pressure of this number of casualties at the BRI proved to be a problem. There was no way patients could be clerked in by the normal system, so whichever medical practitioner or nurse dealt with the patient took their details. A police team of six experienced officers were deployed by Superintendent Mark Rand* to the BRI to record the casualties. They were provided with the relevant paperwork, which was quickly found to be difficult to use and resulted in a duplication of effort by the police and the hospital staff and required them to join together and compare notes to ensure that all of those who attended the hospital were recorded. In addition, the officers had refrained from interrupting the treatment of those most badly injured and so had missed recording their details. Once they had all the information,

* The police investigation followed two main objectives: (1) The investigation into the cause of the fire and all surrounding circumstances, under the control of Detective Superintendent Robert Cooper; and (2) the identification of the deceased, under Superintendent Rand.

it was passed quickly to the casualty bureau. Members of the police team had to attend the other two hospitals to which casualties had also been taken to ensure that all of the casualties had been recorded. The duplication of information, the need to access three sites, and the sheer number of casualties did lead to a delay in police, relatives, and friends learning who had survived, who was being treated, and who might be missing. In turn, this had an impact on the rate by which information could be collected about those who were most likely to be amongst the deceased, and therefore the speed by which the matching process could proceed.

The casualty bureau also took some time to organize despite the best efforts of police staff, because it had not been used for a long period of time, the key to the office set aside for this purpose could not be found, and the callout list of personnel was out of date. Once up and running, the bureau received a total of 780 messages during the first 24 hours and additionally collated the information coming in from the hospital recording teams. Unfortunately, as is often the case, relatives who had reported their family member as missing forgot to then inform the bureau of their subsequent safe return. As a result, those reported missing still numbered in the hundreds on the morning of Sunday, May 12. In total, 284 people sustained injuries while, 56 people died as a result of the fire; 50 people lost their lives within the stand (Figures 4.9 and 4.10), and a further 6 succumbed to their injuries in hospital. The identification team was therefore faced with the need to identify



Figure 4.9 The remains of the stand. (Photo courtesy of West Yorkshire Police.)



Figure 4.10 An alternative view of the remains of the stand. (Photo courtesy of West Yorkshire Police.)

50 bodies, reconciling them with 636 missing persons' reports. However, by following up relatives' reports the number of missing person reports was gradually reduced over the coming days, allowing directed information to be gathered.

Recovery and Identification

This was an open incident, as no record of names associated with ticket sales existed. While the police remained aware that the fire might have been caused by criminal actions, disaster victim identification teams (DVITs) were deployed as the removal and identification of the bodies was given high priority. Before the fire was fully extinguished, a meticulous investigation began to establish the cause. The commitment the officers showed and dedication to duty by all involved in the immediate aftermath of the tragedy led to the cause of the fire being established quickly, with detailed evidence presented to satisfy both the requirements of the coroner's inquest and the public inquiry (Sampson, 1985).

Her Majesty's Coroner John Turnbull visited the site at 6:13 p.m. Saturday. Most bodies were found at the back of block G in the seating area or in the alley along the rear of the stand. A large number were found at the turnstiles where they had been trying to get out; indeed, it was clear that a number had tried to force the turnstiles, getting wedged in them in the process. Additionally, there were a number of bodies in the toilet block and in the

snack area as well as at the locked gates. Many of them had become covered in molten asphalt from the roof, and a number of family groups were among those who had died, often found entwined.

A team comprising coroner's officers, police surgeons, fire service personnel, a pathologist, and 11 police officers initially searched the site. During this first pass they labeled the position of each body, or group of bodies, with sequential numbers. Life was then pronounced extinct by one of the police surgeons, and the officer who had located the body became responsible for its removal from the stand, including documenting the body and ensuring photographs were taken *in situ*, thus preserving continuity. The sequential number and the initials of the officer responsible for the remains at this stage were affixed to the body, and after the remains had been removed a label carrying the same information was left *in situ*, allowing for reconstruction of events during the subsequent forensic investigation. An area of 1 meter (3 feet) around each body was searched, and any personal effects found were placed in a bag and sent to the temporary mortuary with the body. The original search team was supplemented by a further 11 officers at 11:00 p.m. May 11. The last body was removed from the stadium by 4:50 a.m. May 12, by which time the first team had worked continuously and was sent home exhausted. A request by the media to film the officers working within the stand and picture the bodies *in situ* was refused, and access to the site was severely restricted.

Further searches of the stand and the surrounding area were conducted on Sunday and Monday, looking for evidence and recovering personal possessions that had been lost in the evacuation of the stand. The stand search consisted of a fingertip recovery as well as exploration with a metal detector and sieving of debris, a process revealing more personal possessions, some of which assisted in identifying the deceased. The places where bodies had been found were dug out, and the debris was placed in receptacles for further examination; however, this was heavily contaminated with human tissue, especially fats, and was later incinerated.

A temporary mortuary was enacted at Northside Road Ambulance Station. Ambulances were used to transport the deceased, coordinated by a liaison officer who also ensured that a record was kept of the escorting officer's name, the names of the ambulance crew, and the registered name and fleet number of the ambulance. On arrival, the remains were identified to a coroner's officer. The liaison officer was also able to confirm that there was an appropriate number of "body officers" at the mortuary as needed, to offer them advice, and to see to it that their welfare needs were met. Finally, he ensured that all of the property brought in with each body was appropriately documented and that two Polaroid photographs were taken of each item—one for inclusion in the relevant sudden death file and the other to go out to assist police in their investigations.

All postmortems (PMs) were completed by 7:30 p.m. on Monday at Wilton Street Mortuary, with 23 having been performed on Sunday and the remainder on Monday. One officer was assigned to each body, following it and keeping records throughout the PM process. This was a large investment in terms of staff resources; however, it allowed for continuity of information and evidence and ensured that there was little, if any, duplication of effort. As officers followed their assigned body from the temporary mortuary, through the PM procedure, and back to the temporary mortuary, they collected and collated all the information the different specialists were able to provide. This method also allowed officers to become familiar with all the property that had been brought in with those remains. In addition, a small team of officers worked alongside those officers who had been assigned individual bodies, thereby gaining an overview of each case and making suggestions of further avenues to be explored if appropriate.

Once all the requisite information had been gathered by the teams, it was passed to the casualty bureau located at Bradford central police station. Here, antemortem (AM) and PM matches were performed, with comparisons made between data collected at the hospitals and data taken from the missing persons' list. This information was fed into the force's computer system, which also played a valuable part in collating information. Regular reviews and meetings with experts ensured that information could be brought together and added to the growing bank of information as it became available, allowing further matches to be made.

The PMs were carried out by a team of five pathologists, led by Professor David Gee, who were in turn assisted by three doctors from the Department of Forensic Medicine at the University of Leeds. Frank Ayton, also from the University of Leeds, served as forensic odontologist and had two assistants from the Leeds Dental School. The teams were assisted by two mortuary technologists. The police group included a liaison officer (later two officers) who worked with the odontologists, four exhibits officers, and a photographer. It is of interest to note that while the Bradford fire predates Lord Justice Kenneth Clarke's report (Clarke, 2001) following the Marchioness disaster, the supervision of the identification teams and the operation of the casualty bureau were undertaken by a superintendent, whereas the fire itself was treated as a major crime inquiry under the overall command of a detective superintendent. This ensured that the identification side of the disaster was recognized as a separate and focused operation, thereby operating in a similar manner to the roles of the senior identification manager (SIM) and the senior investigating officer (SIO) at an incident today.

As in all identification procedures, it was necessary to establish criteria that met a "standard of proof" set by the coroner before the identification process could begin. In this case, in consultation with the police, he developed a list of criteria that included the following:

- Age
- Sex
- Dental positive
- Dental corroborative
- Fingerprints
- Direct visual
- Abnormalities—skeletal
- Blood group
- Radiography (nondental)
- Stomach contents
- PM findings
- Property positive
- Property probable
- Clothing positive
- Clothing probable
- Vehicles parked near scene
- Circumstantial
- Facial superimposition/reconstruction
- Tattoos

Bodies that have been subject to high temperatures pose their own problems when it comes to the suitability of identification methods. Even tissue that is robust under normal circumstances, such as tooth enamel, becomes brittle after being exposed to high temperatures and has to be treated with care to prevent it from disintegrating. The temperatures are estimated to have reached approximately 900°C, high enough for some of the primary indicators to be of little or no assistance in identification, with loss of soft tissue leading to loss of fingerprints and DNA as well those resulting from unique medical conditions (UMC)—totaling three of the four contemporaneously accepted primary identifiers. Therefore, of the criteria listed by the coroner, a number proved to be of little or no use, including fingerprints and visual recognition. Burned bodies often adopt the “pugilistic pose”; muscles contract with the heat, and bone can fracture and become fragile. This complicated identification of victims in this incident, as family groups had been caught by the flames and had huddled together—reducing the potential for AM data collection as well increasing the likelihood of contamination between individuals. In addition, the melted asphalt had solidified around some of the bodies and had to be removed before any examination could start. This removal resulted in unavoidable damage in some cases, again leading to loss of information. It should be noted that the one criterion expected to be seen on any list of indicators is missing from the aforementioned one: DNA comparison. In 1985, DNA identification was still in its infancy, and it was not until the September 11, 2001, terrorist attacks on the Twin Towers in New

York that the recovery of DNA from burned and decomposed remains was used on a large scale.

Antemortem

No identification is possible without the ability to match AM to PM data. To facilitate this process, the casualty bureau worked to reduce the number of potential victims on the missing list by reevaluating each case, thereby creating a list of those still unaccounted for. This had the additional benefit of maintaining contact with families whose loved ones were still missing, which allowed the bureau to get as much information as possible to assist the identification teams.

Eleven officers initially worked with the relatives to gather information on those reported missing and had to determine how best to approach this sensitive task. By pooling ideas and thoughts the AM team began by reformulating the locally used casualty inquiry form (MD3). The form was redesigned to allow the officers to remain as low key in their questioning as possible while gaining enough information to prevent a second visit, thus ensuring that their intrusion on the family was kept to a minimum. The forms were also intended to allow the officers to obtain information sensitively without having to reveal the extent of the damage to the bodies caused by the fire. The relatives of individuals still unaccounted for were interviewed at the Tyrls police station. The families were provided with a large television lounge in which to wait, which kept the atmosphere relaxed but also allowed relatives to come together and meet others who were in a similar situation. There were no time constraints on the interviews, and many went on for long periods of time. The Calderdale victim support group was also in the vicinity to offer help as necessary.

As the numbers of those still missing was reduced and sufficient information was gathered for identifications to be made, the police deployed a “relative support team.” As identifications began to be confirmed or it became evident that the relatives of the family were among those who had died, these officers worked directly with the family, giving support, advice, and updates as news was forthcoming. Each officer remained with the same family wherever possible, breaking the news of a positive identification to them and keeping them informed about the inquest, which was held on Friday, May 17. This team could arguably be identified as a forerunner of the family liaison officer role with which we are more familiar today.

Reconciliation

By the evening of Tuesday, May 14, all bodies had been identified to the satisfaction of the bureau; however, this remained provisional until the

coroner accepted them at the identification commission. The following morning the coroner chaired a meeting comprising two forensic pathologists, a consultant pathologist, a forensic odontologist, two police surgeons, the superintendent in charge of identifications, two coroner's officers, and a police inspector. At this meeting each victim's identification was reviewed and thoroughly examined to ensure that it met the coroner's standard of proof. While the majority were accepted, the coroner made a small number of further inquiries before the identifications were confirmed. These were undertaken by Thursday, May 16, thereby completing the process to the coroner's satisfaction.

After the Event

The 1980s was a decade in which British football was in the news more for the hooliganism connected to games than for the fortunes of either players or clubs. This problem had led to, among other changes, an increase in the restrictions in the movement of fans around football grounds. This in turn had implications for the ways the police had prepared for the match (e.g., the locked gates and turnstiles) as well as the initial response to the beginning of the fire, including the lack of fire-fighting equipment. Mass fatality events at football fixtures was not a phenomena of the 1980s: Consider the incident at Bolton on March 9, 1946, in which 33 people lost their lives (Firth, 2007), or the disaster at Ibrox Stadium in Glasgow, on January 2, 1971, when 66 fans died (BBC News, 2005). Following the disaster at Burden Park, Bolton, an inquiry was held, and recommendations for crowd safety were made; consequently, in theory, sports grounds were safer places. However, the outcome of the Hillsborough disaster would suggest that recommendations made over the years failed to protect those fans.

An unusual aspect of this incident was the very public manner in which it was viewed: it occurred at an already well-publicized event and was recorded for national television transmission. While some positive factors arose as a result of the very public way the Bradford football stadium fire occurred and the resultant intense media interest, there were also a number of negatives, including a significant amount of pressure on the identification team to achieve quick results. This does not make the Bradford fire unusual by any means, but did add additional pressure on both the forensic teams and the families of those waiting for information.

As an open incident with a large number of casualties, the Bradford stadium fire created specific challenges for the identification teams, not least because this was a fire with a large number of potential victims. Also, the methods of identification applied are always dictated by the cause of death and subsequent condition of the remains, and a fire of this intensity damages

soft tissue to such an extent as to render many common forms of identification redundant.

The systematic approach to body recovery and identifications by West Yorkshire Police appears to have contributed to the efficient and rapid identification of a large number of casualties. There is no doubt that the process was assisted by the fact that the majority of both the victims and their families were local, giving quick access to information on those missing, including medical and dental records. It is of great interest that two elements of the system the police applied anticipated Lord Justice Clarke's (2001) report and the modern approach to DVI in the United Kingdom. In both the assignment of an officer concerned primarily with identifications, albeit not under the official title SIM, and the deployment of the precursor to the modern family liaison system, West Yorkshire Police can be described as forward thinking. Innovative for the time, it is noteworthy that both approaches produced positive results for both the police and those whose lives had been affected by this tragedy.

Immediately following the events in Bradford City stadium, the secretary of state for England and Scotland commissioned Justice Sir Oliver Popplewell to chair an inquiry into the events at the football stadium and to make recommendations with regards crowd safety at sports grounds. Justice Popplewell then undertook an initial analysis, after which he wished to present his findings prior to the beginning of the following season to prevent any such incidents from reoccurring (Figure 4.11). Submissions and evidence were considered from numerous parties, which included the police, fire brigade, football clubs, and other sports associations.

The final report was published in 1986 (Popplewell, 1986), in which Justice Popplewell concluded that the fire started accidentally, in all probability when a lighted match dropped through the gaps between the floorboards of the stand, igniting the accumulated rubbish. The results of the inquiry led to the introduction of new legislation aiming to improve safety at UK football grounds; one of the key outcomes was the prohibition of the construction of new wooden grandstands. The recommendations made by the inquest jury also included a number of themes that continue to be echoed today, not least of which is the need for dentists to ensure that they update records when a patient visits for a checkup: 18 of the 50 (36%) victims recovered from the ground wore dentures, which is a relatively large proportion. Of these, 14 sets of dentures had no identifying marks to assist the teams, and 3 sets were used to assist the identification of the wearer; one individual was identified solely based on the marks of the person's dentures. As a result of the identifications using marks in dentures to assist teams in mass fatality incidents (MFIs) such as this, there is a clear requirement for an identifier to be placed in dentures. The rest of Popplewell's recommendations concerned safety at football grounds including the need for a method of opening exits in an emergency

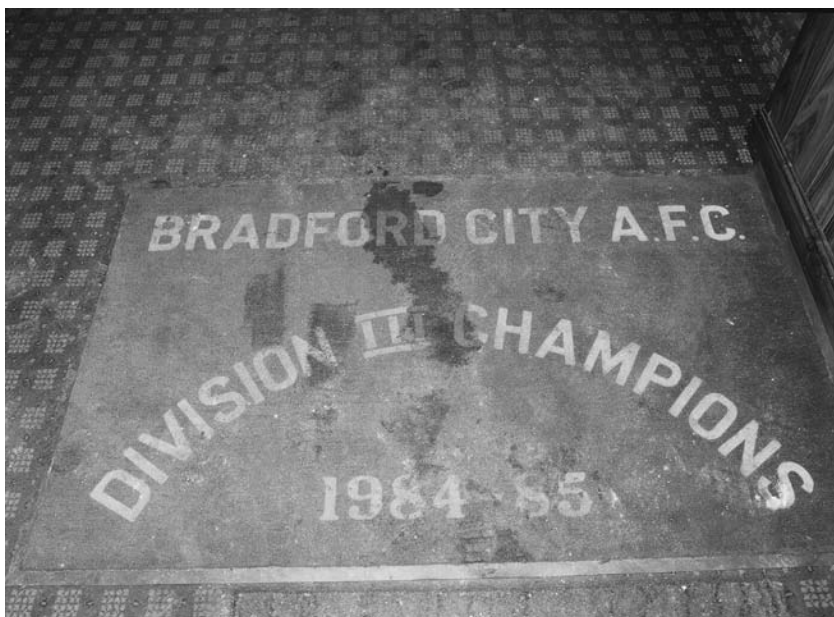


Figure 4.11 A moving reminder of events that day. (Photo courtesy of West Yorkshire Police.)

(*ibid.*). There were stewards with keys at Bradford City Football Stadium, but the tradition of paying them for their time by allowing them to watch the match meant that they were not able to get to the gates quickly enough to unlock them in time. A large number of bodies were also found by the turnstiles, which, because they only turned one way, were a blockage to anyone trying to get out. It was recommended that this be changed so that they turned both ways, and this has since been enacted. The presence of fire extinguishers was a topic of discussion for the inquiry panel, as none were available at the stadium due to the risks that they posed in the hands of hooligans.

The need for a more effective and efficient method of evacuation of all wooden stands was also discussed. There is no doubt that the design of the stand, made of wood with a void beneath and a roof covered in asphalt, contributed to the speed at which the fire spread. The Popplewell inquiry condemned this construction (Popplewell, 1986).

When the report of Popplewell's inquiry came before the British parliament two important improvements were made. The first was the introduction of the, Fire Safety and Safety of Places of Sports Act 1987 (Office of Public Sector Information, 1987), and the second was the revision of the **Guide to Safety at Sports Grounds (the Green Guide)** (Department for Culture, 2008). The second part of the Fire Safety and Safety of Places of Sports Act has a number of sections and removes the earlier distinction between sports

grounds and stadiums. Part 3 of the act came into force in 1988 and relates to the safety of stands. It includes a requirement stipulating that any stand providing covered accommodation for 500 or more spectators must have a safety certificate from the local authority. Originally produced after the **Wheatley Report of 1972, the Green Guide** (*ibid.*) was republished in 1986 after being revised in the light of the **Popplewell report (Popplewell, 1986)**. The new edition gives detailed guidance relating to access and egress points, the structure of stands and buildings, stairways and ramps, terrace structure, the use of crush barriers and handrails, and perimeter walls and fences (Fire-Magazine.com, 2008).

References

- BBC News. (2005). 1971: Sixty-Six Die in Scottish Football Disaster. Available from http://www.bbc.co.uk/onthisday/hi/dates/stories/january/2/newsid_2478305.stm (accessed May 31, 2010).
- Clarke, K. (2001). Marchioness/Bowbelle: Formal Investigation under the Merchant Shipping Act 1995. Available from <http://www.marchioness-bowbelle.org.uk/> (accessed February 5, 2009).
- Department for Culture, M. A. S. (2008). *Guide to Safety at Sports Grounds*, 5th edition. Available from <http://www.culture.gov.uk/images/publications/GuidetoSafetyatSportsGrounds.pdf> (accessed May 3, 2010).
- Fire-Magazine.com. (2008). Litany of Sports Stadia Tragedies. Available from http://fire-magazine.com/index.php?option=com_content&view=article&id=739:litany-of-sports-stadia-tragedies&catid=26&Itemid=13 (accessed May 3, 2010).
- Firth, P. (2007). *Four Minutes to Hell: The Story of the Bradford City Fire*. Czech Republic: Parrs Wood Press.
- Office of Public Sector Information. (1987). Fire Safety and Safety of Places of Sport Act 1987 (c. 27). Available from http://www.opsi.gov.uk/RevisedStatutes/Acts/ukpga/1987/cukpga_19870027_en_1 (accessed May 3, 2010).
- Popplewell, O. (1986). The Papers of the Popplewell Inquiry into Crowd Safety at Sports Grounds. Available courtesy of the University of Bradford from <http://www.brad.ac.uk/library/special/documents/poppleclldtempl.pdf> (accessed May 3, 2010).
- Sampson, C. (1985). *West Yorkshire Police Report: Foreword*. Bradford: Operations Division, Police Headquarters, Wakefield.
- Sivaloganathan, S. & Green, M. A. (1989a). The Bradford Fire Disaster: Part 1. The Initial Investigations: Who Died, Where and How? *Medicine, Science and the Law*, 29, 279–283.
- Sivaloganathan, S. & Green, M. A. (1989b). The Bradford Fire Disaster: Part 2. Accident Reconstruction: Who Died, When and Why? *Medicine, Science and the Law*, 29, 284–286.
- West Yorkshire Police. (1985). *West Yorkshire Metropolitan Police Report: Appendices to Volume 1*. Bradford: Operations Division, Police Headquarters, Wakefield.

Manchester International Airport Fire

Flight KT28M, August 22, 1985

5

SUZANNE GOODWIN
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Introduction

On Thursday, August 22, 1985, at 6:13 a.m., the left engine of a Boeing 737-236 charter plane bound for Corfu caught fire. Although there were 82 survivors from the incident, 53 passengers and two crew members lost their lives, primarily as a result of smoke and toxic gas inhalation. This disaster was pivotal to changes in evacuation procedures and legislative control over materials used in plane interiors. Greater Manchester Police (GMP) was the responding force (Figure 5.1).

Circumstances

Around 5:00 a.m. on August 22, 1985, two flight and four cabin crew arrived at Manchester International Airport to carry out preflight checks in preparation for Flight KT28M to Kerkira, Corfu. The pilot checked the external plane while the copilot completed the flight deck preflight checks. The copilot alerted the pilot to a technical log entry on the previous day's flights (on which the copilot had flown) related to slow acceleration of No. 1 (left) engine. As the plane had flown twice since that entry with no additional recorded



Figure 5.1 Policing regions of England with Greater Manchester Police boundaries highlighted.

incident, the captain subsequently signed his acceptance of the aircraft as “fit to fly.”

This charter plane, owned by British Airways and flying under the banner of British Airtours and formerly named the “River Orrin,” was a Boeing 737-236 series 1 with tail number G-BGJL. The flight was almost full, with 129 passengers and 2 infants (131 passengers and 6 crew; total head count 137) heading to Corfu for a late summer holiday. The pilot requested permission to taxi, and at 6:08 a.m. this was duly granted through an “all clear” by air traffic control (ATC) with confirmation that visibility and conditions were good. The 737 taxied into position and at 6:12 a.m. was prepared for takeoff from the holding point on Runway 24, with the copilot handling. Some 36 seconds later as the airspeed passed 125 knots, the pilot heard a loud thump and assumed that they had suffered a burst tire. Per advised procedure in circumstances of a burst tire, he immediately aborted takeoff, activated the reverse thrusts, and gently modulated the brakes. However, in reality instead one of the engines was on fire. It took 9 seconds for the

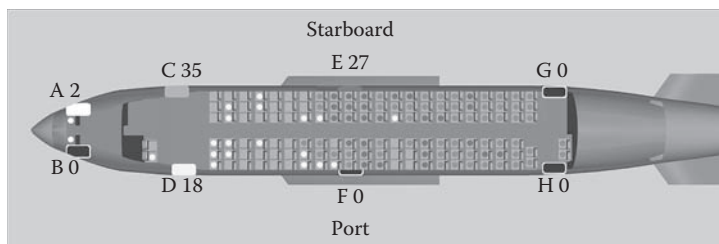


Figure 5.2 Aircraft structure—showing layout of plane in relation to the eight emergency exits. Each exit through which people escaped is shown as a different symbol, together with the number of people who escaped through that exit. The symbols on the seats match the symbol on the exits, to show the seat allocation of those onboard, providing evidence of the dynamics of the exit emergency process. White = the doors through which passengers and crew escaped. Black = door exits through which no-one escaped. / = the probable seating position of those individuals who died. (Adapted from <http://commons.wikimedia.org/wiki/File:Britair28m.png>.)

fire alarm to be activated for the No. 1 engine, as the fire was burning external to the engine. The flight crew requested visual input from ATC, which confirmed that flames and smoke could be seen on the left side of the plane and that evacuation should commence as quickly as possible from the emergency exits on the starboard (right) side. This information was conveyed to the cabin via the address system.

The aircraft taxied to the right into link Delta and came to a halt. The change in direction of the plane caused it to be parked in such a way that the flames were fanned by a light crosswind of around 7 knots that carried the ignited fuel onto, and around, the fuselage. Almost immediately, smoke and fire transients entered the cabin through the aft (rear) right emergency exit (Figure 5.2), which had been opened just prior to the plane coming to a full halt—nobody was to exit safely via this route. The principal point of fire entry into the cabin was via penetration of flames from the burning fuel pool into the space around the cargo hold. Here it gained a stronghold and subsequently entered the aft cabin via floor level air conditioning grills. The fire and smoke were consequently drawn through the cabin and funneled out through the opened rear right exit, which had been the initial site for fire and smoke entry. It is estimated that the fire penetrated the cabin sidewalls just above floor level within 1 minute of the plane coming to a halt. As the fire continued to burn, being drawn toward the rear of the plane, roof panels and overhead lockers ignited and eventually collapsed down onto the seats. “Flashovers”^{*} did not occur, but several aerosol canisters, duty-free bottles

^{*} A phenomenon with various descriptions but occurs when near simultaneous combustion of material ignites in an enclosed area. This normally occurs at 500°C (approximately 930°F).

Table 5.1 Summary of the Exit Procedure

Emergency Exit	Name	Color	Number of People Escaped via This Exit
A	Copilot's emergency exit window	White	2
B	Pilot's emergency exit window	Black	0
C	Right forward	Green	35
D	Left forward	Yellow	18
E	Right over-wing	Blue	27
F	Left over-wing	Black	0
G	Right rear	Black	0
H	Left rear	Black	0
Total			82

of alcohol, and oxygen cylinders exploded, which most likely served to fuel the fire.

As the airline purser, Arthur Bradbury—whose responsibility it was to ensure the safety and comfort of passengers—tried to release the forward right escape slide, it jammed when the slide container lid became entangled on the door frame. This exit was eventually released by the emergency rescue personnel, but in the meantime the purser moved to the left forward door and very carefully opened it to assess its viability as an egress route. There is no doubt that many lives were saved by his swift action: All this was achieved within 25 seconds of the plane stopping. Within 1 minute of the thud being heard, the plane was stationary, and the evacuation drill had commenced (Table 5.1).

As people clamored to reach the emergency exits, a bottleneck developed in the area of the galley. Passengers who could not gain access to the exit via the gangway climbed over seats, and Joanna Toff, Number 4 cabin crew member at the forward passenger door, eventually had to pull passengers free who had become wedged in the forward aisle at the galley constriction, to reestablish the flow of evacuees. Again, there is no doubt that her quick thinking saved many lives. Both the flight attendant and the purser received gallantry medals for their selfless actions, and the two flight attendants who died in the incident, Sharon Ford and Jacqui Ubanski, were also awarded the same honor posthumously (Barthelmess, 1989). Ultimately, Bradbury and Toff had to leave the plane as they began to be overcome by the fumes and smoke emanating from the burning upholstery and fabric of the plane. The majority of deaths from this incident occurred in passengers (and crew) at the rear of the plane, where rapid incapacitation ensued due to inhalation of dense toxic and irritant smoke within the cabin.

Two rapid intervention vehicles (RIVs) were dispatched from Manchester International Airport Fire Service (MIAFS) and were on the scene very quickly as the plane had come to a halt just 825 meters from the fire station.



Figure 5.3 Wreckage of the Boeing 737 aircraft. (Photo courtesy of ITN/Rex Features.)

The left front door of the plane was opened within 25 seconds of the plane coming to a halt and was coincident with the initiation of foam discharge from the first jumbo foam vehicle (Figure 5.3). Water levels within the vehicles are generally sufficient for the initial period of fire control until support from main fire service tenders are able to take over. However, attendance by the airport's fire service was significantly delayed as it could not proceed onto the airport without a police escort. A change had been made to the location of the principal rendezvous point (RVP) and this had not been conveyed to the police escort who waited for the backup fire services at the wrong RVP. The support fire services did not arrive until 13 minutes into the incident. As the preliminary vehicles continued to fight the fire, the water levels within the vehicles were becoming very low. By this stage, backup was vital, but the delay at the RVP would have significant implications as the MIAFS was not equipped to deal with an internal aircraft fire. A second jumbo foam tender arrived on the scene 3-4 minutes into the event, having been retrieved from the paint shop just 550 meters from the fire station. Approximately 7-8 minutes after the aircraft stopped, the airport vehicles had effectively been exhausted of water, and although they were directed to nearby hydrants to restock, due to ongoing maintenance, several of these proved to be dry.

Four minutes after the plane halted, a British Airways crew coach arrived to render first aid and comfort to the survivors and to lead them away to other coaches that began to arrive. By 7 minutes after the event, it was clear that no more survivors would leave the plane unaided, and firefighters in breathing apparatus entered by the right front emergency exit 6 minutes

later. An explosion occurred, and one firefighter was blown out of the exit and onto the tarmac. It was decided to hold off any further attempted entry until all fire appliances were on site and the plane was safe to board. At around this time, the tail section and fuselage aft of the wings collapsed due to thermal weakening.

A total of 17 passengers managed to escape through the left front exit, 34 from the right front exit, and 27 over the right wing. The pilots escaped through the flight deck right sliding window, and the forward flight attendant and the purser escaped through the front left and right forward exits, respectively. In total, 82 survived, and 55 died. Most of these deaths occurred to the rear of the plane, as both rear exits opened into burning fuel. The right rear exit was the initial source of fire entry into the cabin, and the left rear door was opened some time later by the fire services as was the exit over the left wing. One male passenger was found alive in the plane 34 minutes after the fire started, but unfortunately he died 6 days later in the hospital as a result of burns and toxic gas inhalation.

Of the 55 fatalities, 49 had absorbed levels of carbon monoxide or hydrogen cyanide in excess of that required to induce incapacitation, and 6 died as a direct result of thermal assault. A total of 76 survivors were assessed by the local hospital, with most suffering from minor physical injuries. However, 15 victims required admission largely as a result of smoke inhalation, 2 of whom also suffered from severe burns. When admitted to hospital, only one of the survivors required ventilation, but within 12 hours a further five survivors required assistance with breathing. A follow-up of the survivors 12 weeks after discharge revealed that those who suffered the most from respiratory distress were still displaying some form of negative effect, and psychological problems were commonplace, including nightmares, feelings of guilt, travel phobias, fear of crowds, and a fear of smoky rooms.

Identification

This was a closed incident, as a named manifest was available for the 131 passengers and 6 crew onboard. There were no ground-based victims of the incident, although one firefighter was injured following an explosion.

The bodies were removed from the plane by fire service personnel. The first body was removed from the aircraft at 8:30 a.m. and was transferred by ambulance to nearby aircraft Hangar 5A, which was owned by British Airways, the parent company of British Airtours. The hangar became the temporary mortuary. The individuals were not photographed *in situ* prior to removal; therefore, no contextual information was available regarding seat numbers, and no record was kept of who had retrieved each body or where it

had been found. In addition, the bodies were not assigned a unique reference number (URN) until they reached the temporary mortuary.

The first body arrived at the mortuary at 8:24 a.m., and by 9:40 a.m. the last had arrived. Life was pronounced extinct for all by 9:54 a.m. by the divisional police surgeon. The mortuary was run on a three-line basis, with each comprising a civilian pathologist and an aviation pathologist from RAF Halton, supported by RAF forensic odontologists. Each team was also assigned a detective sergeant (DS) and two detective constables (DCs). By the time the photographic officers from GMP arrived, all bodies were laid out in rows in the temporary mortuary under white sheets. Many of the bodies were badly burned with severe facial disfigurement. The disaster victim identification (DVI) process commenced. This was followed by a sequential numbering system until M54 was reached as the last victim was male. By the end of the operation there were 33 females and 21 males, totaling 54 victims. Each body with its clothing and personal effects was photographed *in situ* with no items removed until the postmortem (PM) examination. A brown luggage label with a handwritten URN was included in each photograph. J. H. Kenyon and Son were retained to handle the personal effects and to liaise with the funeral directors. Coroner Leonard Gorodkin did not let family members view the deceased, but three individuals were identified by survivors who were relatives of the deceased.

The conditions within the hangar were not ideal. Bodies were stored under white sheets as body bags were not provided. The personal protective equipment (PPE) supplied was not appropriate, and there was no separate recreation area for the mortuary team, which consumed meals in the hangar. There were holes in the roof, which meant that the floor was wet at all times, making it an unsafe environment for electrical equipment. The lighting was poor, and there was no running water or plumbed-in drains. Toilet cleaner blocks were crushed on the floor in an attempt to cover the smell of smoke, fire, and burned flesh, resulting in officers commenting that the hangar smelled like a urinal. The association of these smells remained with many officers from that day.

The process adopted in the mortuary was a preliminary strip search of the remains to recover all artifacts including jewelry and other personal effects, all of which were photographed. The body was then radiographed before passing to the pathologist for the PM examination and then to the odontologist for dental recording. Fingerprints were then documented prior to embalming and release of the bodies. Given the often burned nature of the remains, recovery of fingerprints was a highly skilled operation. With the coroner's permission, skin was sometimes removed with a scalpel to ensure that the conditions were optimized to retrieve ridge detail. Where skin or a digit was removed for this purpose, it was transferred to the force's

fingerprint bureau for specialized processing that could not be performed in the hangar.

Officers who manned the casualty bureau set up the connection with families to initiate the antemortem (AM) data collection. Fingerprints were recovered from the workplace in preference to family intrusion, and dental records were secured by phone rather than by personal visits to the dental practitioner. These contacts were made by the casualty bureau officers and not by assigned family liaison officers (FLOs).

The primary means of identification was agreed as being dental and the secondary level as being fingerprints. DNA was in its infancy and so was not considered a valid identification medium. Identity was supported by personal effects including documentation and jewelry. Identity was confirmed via dental matching for 46 individuals (84%) and three (5%) through fingerprint matching. One individual was identified in hospital, leaving only five (9%) individuals unaccounted for in relation to the aircraft manifest; three of these were identified by survivors of the incident who were also relatives. Two victims were identified by exclusion on the basis of age: A 2.5-year-old infant was known to be the only child of that age on the plane, and a 9-year-old girl, who after checking the manifest, was the only child of that age not accounted for.

Of the 54 who died on the aircraft, 43 (80%) had cyanide levels in excess of 135 microg/100 ml; 21 of these had levels above 270 microg (i.e., a fatal level). A total of 40 victims (74%) had levels of carboxyhemoglobin in excess of 30% saturation, and of these, 13 had levels in excess of 50%, which is the fatal threshold. A total of 6 (11%) individuals died as a direct result of thermal assault, and the remaining 48 (89%) were confirmed as dying through smoke or toxic gas inhalation. Of the 55 deceased, all were from the United Kingdom except for one individual, who was from West Germany.

After the Incident

An Aircraft Accident Investigation Branch (AAIB) report (Air Accident Investigation Branch, 1988) was submitted by Donald Cooper, the chief inspector of accidents, to Paul Channon, secretary of state for transport, on December 15, 1988—over 3 years after the incident. This report identified that the cause of the mass fatality event was cracks in Combustor Can 9, which eventually fractured and sheared the dome which resulted in its ejection. The dome then struck the under-wing fuel tank access panel, producing a hole that was about 42 inches in diameter. The fire ignited when fuel from the punctured wing tank access panel came into contact with combustion gases escaping from the damaged engine. As the aircraft continued to come

to a halt slowly, the fuel began to burn vigorously, and the prevailing wind carried it over the fuselage and under the cargo region of the plane.

The engine was a Pratt and Whitney JT8D-15, which was new in 1980. In 1983 the engine had been removed and stripped and then reassembled with repaired combustor cans from another engine. Combustor Can 9 had been the worst affected, with cracks that ranged in size between 2 mm and 160 mm in length. Cans 6 and 7 also exhibited cracking, and all cracks had been addressed by direct fusion weld repairs. The cans were installed on February 2, 1984, and ran for a further 4,611 hours before ultimate failure of Can 9. Crews had reported a number of problems with this engine, including slow acceleration, slow start, and some throttle staggering,* resulting in them being slightly out of sync. In summary, the report concluded that the cause of the accident was an uncontained failure of the left engine, initiated by a failure of the No. 9 combustor can, which had been the subject of a repair. A section of the combustor can that was ejected forcibly from the engine struck and fractured an under-wing fuel tank access panel. The resulting fire developed catastrophically, primarily because of adverse orientation of the parked aircraft relative to the wind, even though the wind was light.

Major contributory factors were the vulnerability of the wing tank access panels to impact, a lack of any effective provision for fighting major fires inside the aircraft cabin, the vulnerability of the aircraft hull to external fire, and the extremely toxic nature of the emissions from the burning interior materials.

The major cause of the fatalities was rapid incapacitation due to the inhalation of the dense toxic and irritant smoke atmosphere within the cabin, aggravated by evacuation delays caused by a forward right door malfunction and restricted access to the exits.

A coroner's inquest was held September 8, 1986, with identification evidence given by Assistant Chief Constable David Phillips of GMP.

Safety Recommendations

The AAIB report issued 31 recommendations (Air Accident Investigation Branch, 1988), including the following:

- Development of procedures to ensure that following a ground fire emergency the plane is positioned with the fire downwind of the fuselage.
- Emergency equipment for use by the cabin crew should be stowed at the cabin crew stations.

* When one engine is turning at a slightly different revolution per minute (RPM) than the others.

- Review of cabin configuration with particular reference to galley positioning and access to the over-wing exits.
- Regulation of aircraft cabin materials to include limitations of smoke and toxic and irritant gas emissions.

Many features were suggested but dismissed including the following:

- Onboard water spray and mist fire extinguishing systems built into the aircraft.
- Provision of smoke hoods and masks for passengers.

Within the space of just 5 minutes after a fire that occurred on the ground, 55 people lost their lives. Something as simple as parking the plane in a direction contrary to the prevailing wind could have prevented this disaster. As so often arises in the postmortem examination of a mass fatality event though, no single factor is solely to blame as there is frequently a catalog of sometimes very small coincidences that can escalate into a catastrophic outcome.

August 22, 2010, 25 years later, family and friends gathered at Manchester International Airport to remember those who had not survived and to give thanks for those who did. Today, a plaque and a planted tree mark the spot to remember those who died (Faith, 1998).

References

- Air Accident Investigation Branch. (1988). AAIB report No:8/88—Boeing 737-236, G-BGJL, at Manchester Airport.
- Barthelmess, S. (1989). The Manchester Accident: The Final Chapter. [flightsafety.org](http://www.flightsafety.org). Available from http://www.flightsafety.org/fsd/fsd_feb89.pdf (accessed January 7, 2010).
- Faith, N. (1998). *Black Box: The Final Investigations*. London, UK: Boxtree.

King's Cross Underground Fire, November 18, 1987

6

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SUE BLACK

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Introduction

On the evening of November 18, 1987, 31 people lost their lives, and many more were seriously wounded and traumatized as a result of a fire that ravaged King's Cross underground station in London. A joint response and investigation was undertaken by the British Transport Police (BTP), which investigated the cause of the fire, and the Metropolitan Police Service (MPS), which undertook victim identification (Figure 6.1). Consequently, a large number of officers were deployed to the incident. This event had far-reaching effects on future multiagency cooperation as well as amendments to safety guidelines and requirements for public transport providers.

Circumstances

The London underground system is the oldest and largest mass transportation system in the world, covering an area roughly the size of Belgium (Stern, 1997). Inevitably, with a system carrying millions of people daily, there are fires, although there are fewer incidents than in earlier years. For example, in 1980, 1,246 fires were reported on the tube network, some relatively serious and resulting in the evacuation of the underground tunnels but fortunately resulting in no casualties. Smoking was banned completely by February 1985.

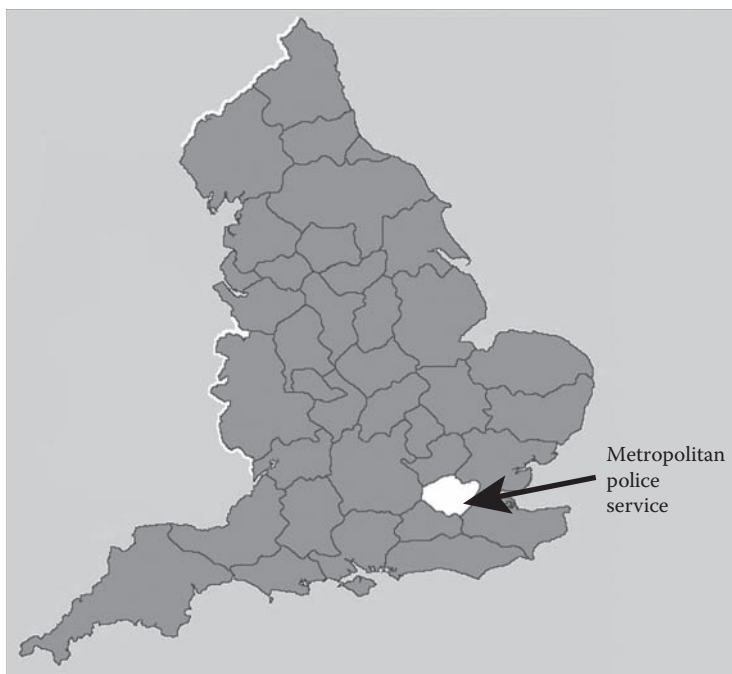


Figure 6.1 Policing regions of England with Metropolitan Police Service boundaries highlighted.

Strangely, and tragically, little was done to address the issue until the fire at King's Cross in November 1987.

King's Cross is the terminal complex for two very busy commuter railway stations—King's Cross and St. Pancras—and is a pivotal underground hub where six tube lines intersect: the subsurface Circle and Hammersmith, Metropolitan and City lines, and the deep-level Northern, Piccadilly, and Victoria lines (Figure 6.2). On an average weekday in 1987, over 250,000 passengers passed through this terminal, with over 100,000 of these occurring at peak times in the morning and early evening rush hours.

Despite being in London, after the fire a joint investigation was launched, as it occurred within the MPS's boundaries. However, the policing of the railway stations, tracks, and underground systems does not fall under the jurisdiction of the Metropolitan Police Service as one might think, but lies with the British Transport Police, a special police force founded in 1949 following the British Transport Commission Act.

The original site of King's Cross was known as Battle Bridge, and it has been suggested that Queen Boadicea routed the Roman legions here before razing Londinium to the ground. It became known as King's Cross in 1830 after the erection of a tall octagonal building, surmounted by a statue of King George IV. The building was demolished in 1845, but the area did not lose

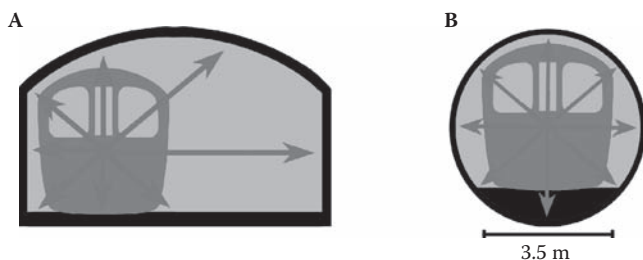


Figure 6.2 Illustration showing the subsurface tunnels, with associated space around the tube trains. A: Two-track subtrack tunnels, found on shallower lines, allow more air to circulate, with a reduction in the piston effect. B: Single-track tunnels, found on deeper lines such as the Circle and Piccadilly services, allow minimal air circulation because of the small gap (approximately 15 cm) between the tunnel and the train. This results in tunnel wind, and consequently, the piston effect.

its name; King's Cross became the new terminus for the Great Northern Railway in 1852 and the Metropolitan railway line introduced just over a decade later in 1863.

In 1987 many of the older underground stations still had wooden escalators and mechanisms that had not been upgraded since their installation. Due to cutbacks and financial constraints, records showed that many of the escalators had not in fact been cleaned since the 1940s. Approximately 2 weeks prior to the disaster, gaps had been observed between the wooden slats and skirting of the Number 4 Piccadilly escalator. This had been caused by “crabbing,”* and about 30% of the fire cleats (safety mechanisms used in escalators) were noted as missing. Combined with the wooden construction of the escalator and decades of buildup of paint, varnish, grease, and litter, these all served as potential precursors that would encourage and foster a seed fire. Indeed, there had been several small fires on the underground, as witnessed by numerous blackened marks on the escalator skirtings. These occurred predominantly on the right-hand side where people would stand to light a cigarette before disembarking from the escalator. Smoking was largely banned on the underground following a significant fire at Oxford Circus in November 1984, and not fully banned until a year later. However, it was very common for passengers to be seen lighting up their cigarettes at the top of the escalators in preparation for exiting from the underground station. This is believed to be the cause of the fatal fire at King's Cross in November 1987. A match, struck to light a cigarette but not extinguished when it was dropped, fell through the defective wooden slats of the ascending escalator Number 4

* A gradual deformation of shape that alters spacing.

of the Piccadilly line and set fire to grease and debris that had accumulated in the trench below.

Light smoke was first seen curling through the wooden runners of the escalator at approximately 7:33 p.m., and it was reported to the ticket clerk, Derek Newman, by passenger Philip Squire (Stern, 1997). Newman then alerted the safety inspector, Christopher Hayes, who set off to investigate rather than alert the emergency services. Although several passengers commented on seeing smoke, none thought about prevention or alerting authorities until eventually passenger Abdeslam Karmoun raised awareness by hitting the “stop” alarm button on the escalator as he could see the smoke rising up toward the ticket hall. Even then, passengers pushed him aside and continued on their commute by walking up the escalator, disinterested in the warnings being issued to them. Now alerted to a possible serious situation, two BTP police officers investigated the smoke rising from the escalator; knowing that their radios did not work in the underground, one ran to the outside of the building to raise the alarm that there was a fire at King’s Cross underground station. The London Fire Brigade took a call at 7:36 p.m. that a “small” fire had been reported at King’s Cross; since Soho Fire Station was the closest, it was the first to respond. Station officer Colin Townsley was in charge that night, and he and his crew arrived at the station at 7:42 p.m.

Hayes located the seat of the fire in an upper machine room controlling Escalator Number 4, but he was beaten back by the severity of the heat and could not get near it. Railway men brought fire extinguishers but were unable to bring the fire under control. A water sprinkler system had been fitted to the escalator but was not automatically activated through smoke or heat and had to be manually turned on. For some reason, Hayes did not activate the sprinkler system.

An order was issued and transmitted to all train drivers that no trains should stop at King’s Cross in an attempt to limit the number of passengers gaining entry to the station. Of course, this also cut off a potential escape route for the 200 or more passengers who would become trapped in the lower tunnels. As trains passed through the station, passengers banged on the side of the trains, desperate to be let on board and taken away to safety, but the drivers were under strict instructions and did not stop. It was only later when thick black smoke started to enter the tunnels that some drivers disobeyed the command and stopped, although even then some passengers onboard the trains still tried to disembark at King’s Cross and became abusive when told that they should get back on the train.

BTP officers decided that the station had to be evacuated. Unfortunately, however, they were not familiar with the geography of the complicated maze that was the underground tunnels of King’s Cross. One of the BTP officers and a railway man blocked access to Escalator 4 and directed the passengers at the lower levels to one of the Victoria line escalators, although some passengers



Figure 6.3 The burned-out King's Cross Station. (Photo courtesy of Nils Jorgensen/Rex Features.)

still tried to barge past them to get onto the Piccadilly escalator, which was now shrouded in billowing smoke. Unknown to many, they would be traveling upward to a certain death. At 7:45 p.m. there was a sudden “whooshing” noise, and a mercilessly intense fireball exploded from under the escalator, ballooned up into the ticket hall and ignited all combustible material in the area. This occurred approximately 17 minutes after the first report of smoke. As a result of the flashover of the fireball, the temperature rose by several hundred degrees in a matter of seconds, and it was believed that it reached 600°C with zero visibility. Many of the victims were burned beyond facial recognition with their clothes, personal effects, and many of their identifying characteristics were destroyed through the intense raw heat. Most of those who died, including Townsley, were in the ticket hall or on the upper part of the escalators at the time, just yards from safety (Figure 6.3).

Two physical forces turned a potentially manageable fire into a fireball furnace that was difficult to either control or predict: the “trench effect” and the “piston effect.” The trench effect arises when a fire burns next to a surface that is on an incline. In the early stages of such a fire, the flames lay low in the escalator rather than burning vertically, which gives the impression that the fire is not overly large. Because of the incline of the escalator this meant that the steps further up the escalator heated up. The lack of flames and the relatively clean smoke would have caused a false sense of security. However, once the steps above began to heat up, the gases reached temperatures optimal for auto-ignition, and then a fireball was expelled with considerable force up the

inclined slope, increasing the size of the fire exponentially and causing the flashover. The arrangement of the ticket hall and the escalators acted as an efficient furnace with an obliging chimney, which was in fact the only exit available to those trying to escape. Fires of this nature do not burn downward; indeed, there was no burning below the level of the escalator, and technically passengers would have been safer if they had remained in the tunnels rather than trying to escape upward past the fire. The fire was assisted by the piston effect: Inside a tunnel, air is confined by the walls and so can move only in a forward or backward direction. Air is pushed along the tunnel by the forward momentum of the trains and subsequently pulled behind the trains due to suction. This type of push–pull air movement is particularly prevalent in underground train tunnels because of the close fit of the train to the tunnel, and passengers become aware of an approaching train via the “tunnel wind” that precedes its arrival. As the trains continued to pass through King’s Cross station, they fed air to the fire and most certainly helped to keep it alight long after it would normally be expected to have been extinguished.

At 8:16 p.m. the King’s Cross fire was classified as a major incident. A total of 35 fire crews and over 150 firefighters were deployed, and the fire was not fully extinguished until 9:00 p.m. Five separate emergency control rooms were set up:

- Metropolitan Police Service
- British Transport Police
- London Fire Service
- London Ambulance Service
- London Regional Transport

Body Recovery

Initial entry into the underground station was only via London Fire Brigade personnel with breathing apparatus. The building was deemed to be potentially unsafe and had no electricity or natural light plus thick dense smoke and residual heat; consequently, only trained personnel with personal protective equipment (PPE) were permitted to enter the station. It was clear from the very early stages of the postfire operation that there would be deceased individuals. Due to these conditions, bodies were located and recovered by fire personnel only. The position and location of a body was noted in very brief terms, and the remains were placed in a body bag with the scene notes included. No numbers were assigned to a body at this stage, and it was simply transported to the surface where death was certified by medical personnel. Bodies recovered from the ticket hall were most severely burned, and the retrieval process was not easy due to the nature of the incident and the

difficulty of the working conditions. The recovery phase was completed by 4:30 a.m. November 19, 1987.

Over 60 survivors had been transferred to nearby hospitals, including University College Hospital (UCH) just over 1 mile from King's Cross. Other survivors were transported to St. Bartholomew's and St. Mary's hospitals, and all casualties had been relocated within 40 minutes of the flashover, with most suffering from burns and smoke inhalation.

Two soldiers passing the scene in a military vehicle stopped to offer assistance and were tasked with the responsibility of transporting the deceased to UCH as all available ambulances were engaged with the transfer of injured survivors. The first 14 bodies recovered were transferred to UCH, and a small storeroom was allocated as a temporary body holding area in the basement of the hospital. Four BTP officers were tasked with searching each body for personal effects, and a unique reference number (URN) was assigned to each body. UCH bodies were prefixed with a 1; hence 101–114. The URN was written on a tag that was attached to each body bag in turn as it was opened, and two further tags showing the URN were attached to each individual—one to the large toe and one to the wrist. When the body-holding area became full, operations moved to the hospital chapel. The first body had been received at 8:30 p.m., and by 10:20 p.m. UCH was at capacity. This caused a backlog at the underground station as the deceased continued to be brought to the surface and out of the station in body bags. They were lined up on the concourse waiting for an alternate body holding area to be identified when the press managed to gain access and started to take photographs. This heightened the urgency to identify a second body-holding area, which was eventually set up in the nearby Methodist church on Birkenhead Street. A total of 13 bodies were taken to this area and were duly laid out on the floor of the chapel, each assigned a sequential number from 101 to 113. Although each number assigned was unique to the bodies within the Methodist church, they duplicated the numbers already assigned at UCH, and in due course this would have to be rectified.

One by one, each body was taken to a central table, and a team of police and medics removed clothing and retrieved and logged all personal effects. Most of the bodies in the second holding area had been recovered from the ticket hall and escalator regions and so were badly burned. On completion of the body search, only four tentative names could be attributed to these deceased through personal effects. The entire process took over 2 hours per body, and were finally removed by undertakers at 1:30 a.m. the following day and the church decommissioned.

In due course, a further three bodies were found, and with UCH full and the Methodist church decommissioned, these were transferred to the mortuary at St. Bartholomew's Hospital. By dawn on the morning of November 19, all 30 deceased had been searched for identification and

transferred to the public mortuary associated with St. Pancras Coroner's Court on Camley Street. Here the postmortem (PM) examinations would begin later that day under the direction of Home Office pathologist Dr. Iain West from Guy's Hospital.

Identification of the Deceased

King's Cross is under the jurisdiction of the Inner North London coroner, who at the time was Douglas Chambers. He had been notified of the incident and instructed West to assume the role of senior forensic pathologist with responsibility for the postmortem examinations to determine both the cause of death and, where possible, the identity of each of the deceased. Due to the degree of burning, Chambers agreed with West that visual identification would not be accepted as a primary identifier, and therefore confirmation of identity must be achieved by alternate means.

A casualty bureau emergency contact number had been released to the media within hours of the incident. The bureau logged over 10,000 potential missing persons, and as this was an open incident it was clear that the identification process could become somewhat protracted. Despite this, the Coroner instructed that he would open the inquest on the following Tuesday, November 24, which placed tremendous pressure on the MPS and BTP officers and the forensic teams. It should be noted that although DNA was a subject of considerable scientific interest in 1987 it had not been adopted as a means to aid identification in a mass fatality event. Identifications, therefore, identifications were based on dental records, fingerprints, identifiable traits, and personal effects.

The bodies from UCH had the prefix 1 removed, thus eliminating the duplication and reinstating the URN of 01–14. Victims from UCH could then be easily differentiated from the bodies transferred from both the Methodist church and from St. Bartholomew's Hospital, which retained the prefix and were consecutively numbered 101–116. Although 30 deceased would be processed in this way following the protocol in a disaster victim identification (DVI) scenario, there were 31 fatalities from the event, as a gentleman died in hospital 3 weeks later due to the severity of his burns and smoke inhalation—his identity was known.

Late on Thursday, November 19, only 24 hours after the event, all PM examinations had been completed in the cramped, badly lit, and out-dated mortuary at Camley Street. Some bodies had been prioritized, as police officers were already confident of the names of the deceased due to retrieval of personal effects or that they were known to the officers, including the station officer. Of the 30, 24 had been identified, and 18 of the names were released to the press that evening even though they had

not been confirmed by the coroner's inquest. By the time of the inquest the following Tuesday, 28 of the 30 deceased had been positively identified to standards considered acceptable by the police at that time. Each of these identifications was confirmed by the coroner at inquest, which was completed within 1 hour and the bodies duly released to families for burial. The inquest was adjourned to allow the pathologist's results to be obtained in relation to the causes of death, although it was not anticipated that there would be any contentious findings.

Victims 103 and 115

Two of the deceased had not been identified—victims 103 and 115. Both had been located in the main ticket hall, and both were very badly burned. West was requested to undertake a second, more detailed PM to ascertain if any additional features could be used to assist in the identification process for the two remaining, unidentified victims, both of whom were male.

Victim 103 was a young black man who had been recovered close to the top of the Victoria line escalator, but little additional information was forthcoming from the second PM. Although a set of fingerprints was retrieved, it was felt that the best means of achieving his identity would be through a silver-colored metal bracelet that had been attached to his wrist. As a result of police work, and not through science, a possible name was suggested for victim 103. On Friday, December 4, his father traveled to London and confirmed the identity of his 23-year-old son based on the metal bracelet. Following a separate inquest, body 103 was finally released for burial.

This left only body 115 to identify, and this process would take 16 years, two months, and 15 days to complete. The PM confirmed that he was male, approximately 5 feet 2 inches in height, middle aged, and a heavy smoker, with a full set of good-quality (non-National Health Service) dentures. He suffered from angina and emphysema and had been drinking prior to the fire, but he would still have been under the legal limit to drive. Particularly characteristic was a large circular scar on his forehead above his right eye, which corresponded to previous brain surgery. On close examination an arterial aneurysm clip (Sugita No. 5) was retrieved from the brain, indicating that the gentleman had suffered from an intracranial bleed and had undergone surgery some considerable time before the King's Cross incident (Figures 6.4 and 6.5). A partial fingerprint was retrieved from the tip of his middle right finger, but a search of the national fingerprint database did not produce any hits, suggesting that he did not have a criminal record. Richard Neave, a forensic facial expert, reconstructed the face of body 115, which resulted in extensive media coverage at the time. However, no credible names came forward to permit the identity of this individual to be secured, and he remained the only victim of the fire not to be identified.

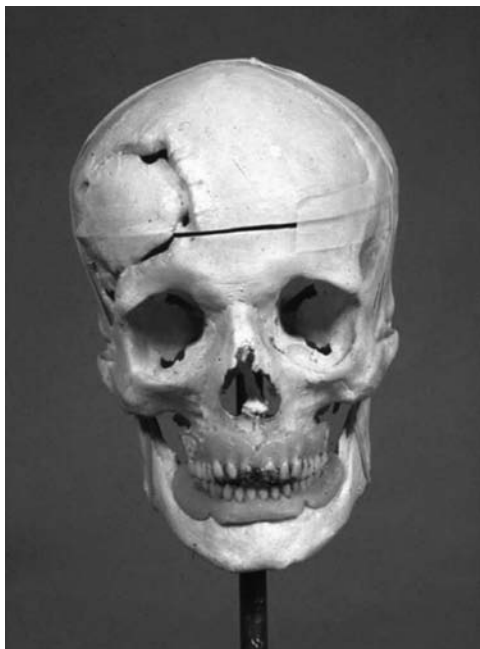


Figure 6.4 Skull of victim 115, showing osteological evidence of earlier brain surgery. (Photo courtesy of Metropolitan Police Service.)

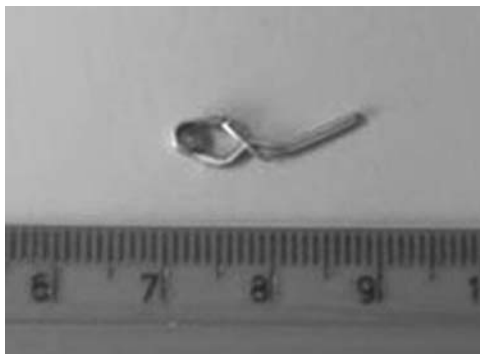


Figure 6.5 Arterial aneurysm clip (Sugita No. 5) removed from the brain of victim. (Photo courtesy of Metropolitan Police Service.)

After the Incident

Transport Secretary Paul Channon made a statement before the House of Commons on November 23 that there would be a public inquiry into the disaster and that it would be chaired by Desmond Fennell, a highly respected lawyer and member of the Queen's Council. The public hearing was scheduled for February 1988, and a 286-page report (Fennell, 1988) was submitted to the transport secretary on October 21, 1988. Fennell made a total of 157 recommendations, which he classified into four groups: most important, important, necessary, and suggested. Recommendations in the highest priority category included the following:

- All escalators to be fitted with heat detectors and machine rooms with smoke detectors
- Wooden skirting boards and balustrades, decking and advertisement panels to be replaced with metal by July 1989
- Escalator design to be reviewed to facilitate easier and more effective cleaning
- Station evacuation plans to include evacuation by train
- Greater integration of emergency services
- Fire brigade to liaise with police before the body recovery process commences
- Appointment of a nonexecutive director to the board of London underground with responsibility for safety
- BTP radio equipment to be compatible with that of the London Fire Brigade

King's Cross returned to normal operations by March 5, 1989, but body 115 remained unidentified. With no new names being put forward for consideration, the investigation was wound down in 1990 but never forgotten. In 1995, singer Nick Lowe immortalized the status of body 115 with the song, "Who Was That Man?" in his *Party of One* album. Names did come forward periodically; one serious contender was James Brown, a Scottish trawler man who had gone missing in 1984. Many features matched with body 115 but the fingerprints did not, so he was finally eliminated as a possible match.

In 2002, the *Times* carried a small article to commemorate the 15th anniversary of the fire, and this came to the attention of Mary Leishman, whose father, Alexander Fallon, had been missing since just before the time of the fire. Alexander was born in Falkirk, Scotland, in 1914, and served with the Royal Artillery in 1939, from which he was demobbed in 1946. He lived with his wife and four daughters, but when his wife died of ovarian cancer in December 1974

he found it difficult to cope and largely abandoned his family and moved to London to live with his sister. It was reported that in 1980 he collapsed in the street and was rushed to hospital where he underwent brain surgery for a hemorrhage. He kept some telephone contact with his family, and when he relayed the incident he also mentioned that “they had put a clip in his head.” His last contact with his family was via a phone call in October 1987.

Alexander Fallon was 72 years of age when he went missing and was reported to have been approximately 5 feet 6 inches in height. This caused some problems for the team as the pathologist had aged body 115 to be at least 12 years younger than this and about four inches shorter. This problem could have been avoided had suitable parameters been set to incorporate potential ranges of height and age thus avoiding incorrect exclusion as a result of too narrow an estimate, with the understanding that these discrepancies were almost irrelevant. Nevertheless, on the basis of these inconsistencies, the police had excluded Fallon from the earlier inquiry. However, after the article appeared in the *Times* in 2002 about body 115, Leishman again contacted the police (Chambers, 2007) to inform them that Fallon was a smoker, liked a drink (he was not a problem drinker as was suggested in the media), had a full set of dentures, had previous brain surgery that resulted in a clip being placed in his head, and had been receiving benefits up until the week before the King’s Cross fire and was residing in London at that time.

The police tried to retrieve antemortem (AM) fingerprints from his daughter’s house; however, the investigation was now 15 years later on, and no traces could be found. Fallon did not have a criminal record, so his prints were not recorded on the police database. The police were not successful in retrieving either his dental or his medical records.

DNA comparison appeared to be the only option, but this would require an exhumation. This was facilitated as a result of the fact that, although body 115 was buried in a cemetery it was not in consecrated ground, which would make obtaining an exhumation order easier. Andrew Reid, the coroner for Inner North London, was approached, but the Home Office denied the request. Leishman took her story to the media, and an article was published in the *Times* in July 2003—but to no effect. A decision was made to review the case, and the task was given to the head of the Criminal Investigation Department (CID), Detective Chief Superintendent Nick Bracken.

A photograph was found of Fallon that had been taken 2 years before he went missing (Figures 6.7 and 6.8). It showed a clear circular scar over his right eye, and the image and the photos of the skull of body 115 were taken to Professor Peter Vanezis, who undertook a superimposition (Figure 6.9). The scar on the skin, as seen in the photograph, very closely matched the appearance of the skull of body 115. His daughter remembered that he had been taken to the Royal London Hospital when he collapsed, and Bracken and his team set about searching the hospital archives for Fallon as a patient. A

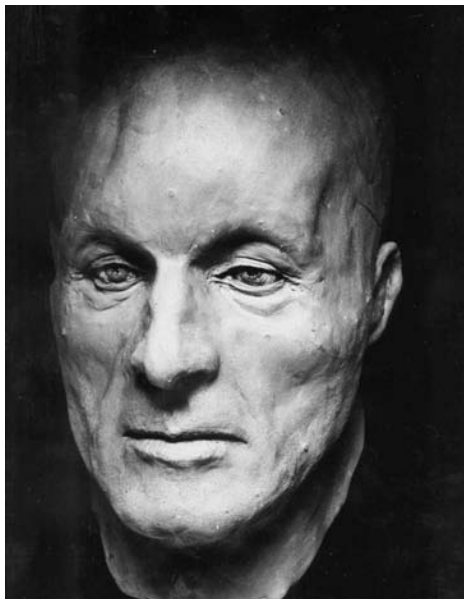


Figure 6.6 Richard Neave's reconstruction of the face of victim 115. (Photo courtesy of Metropolitan Police Service.)

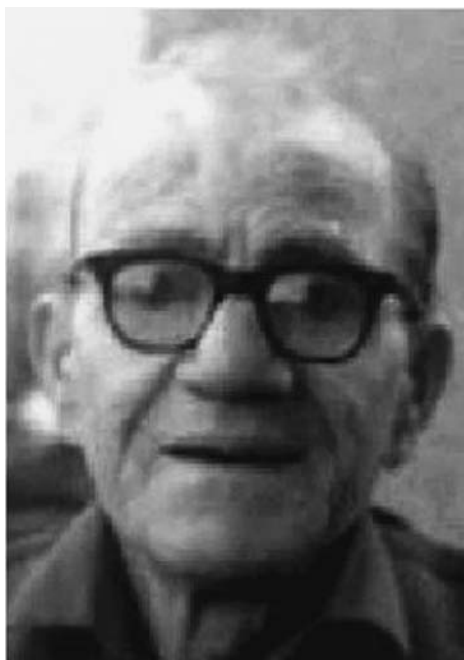


Figure 6.7 Antemortem photograph taken of Fallon approximately 2 years before death. (Photo courtesy of Metropolitan Police Service.)

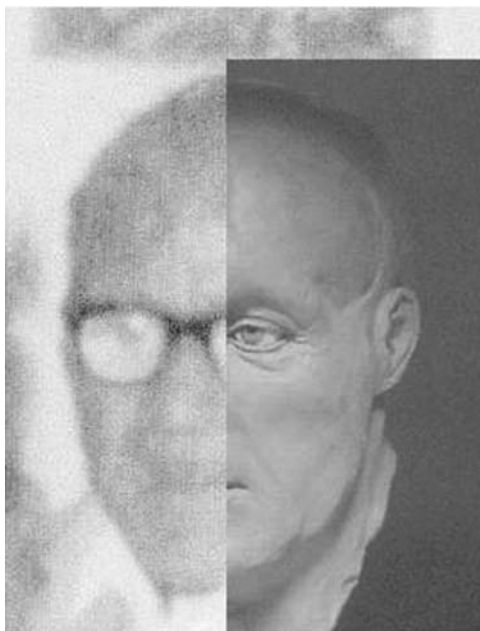


Figure 6.8 Comparison of postmortem facial reconstruction and Fallon's ante-mortem image. (Photo courtesy of Metropolitan Police Service.)

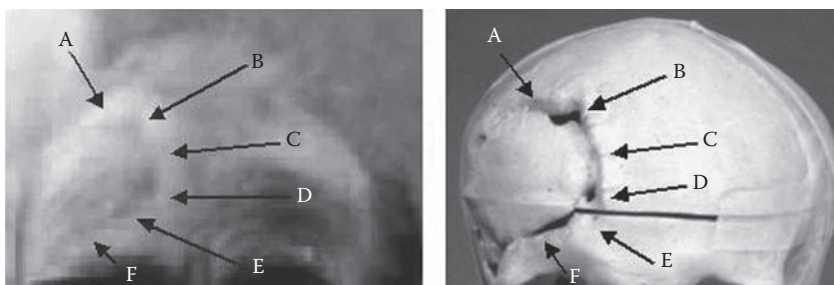


Figure 6.9 Superimposition showing the scar and matching skull trauma. (Photo courtesy of Metropolitan Police Service.)

folder was eventually found and listed the surgeon as David Hardy, who was able to confirm that at that time (1987) he had been trialing Sugita No. 5 clips for brain surgery and also verified that the appearance of the surgery on the skull of body 115 was representative of the work he did at that time.

The coroner opened an inquiry on this case February 3, 2004, and concluded that there was now sufficient evidence to confirm that body 115 was Fallon. An exhumation order was granted in June 2004, and Fallon was exhumed and cremated and his ashes taken back to Scotland. While the commemorative plaque at King's Cross station had for the previous 17 years



Figure 6.10 Commemorative plaque at King's Cross station. (Photo courtesy of Metropolitan Police Service.)

carried the names of 30 deceased and one unidentified, it now carries Fallon's name as well (Figure 6.10).

It is not always possible to achieve a match for those who lose their lives in a mass fatality event, and certainly for a long time it looked as if that would be the situation for body 115. However, the sheer dogged determination of both police officers and a daughter who were not prepared to concede defeat ensured that another family was able to achieve some element of closure and bury a father with the dignity that he deserved.

References

- Barton, J. A. (1989). *Lessons from the King's Cross Disaster*. London: Health and Safety Executive.
- Chambers, P. (2007). *Body 115: The Mystery of the Last Victim of the King's Cross Fire*. London: Wiley.
- Fennell, D. (1988). Investigation into the King's Cross Underground Fire. HMSO. ISBN 0-10-104992-7. Available from http://www.railwaysarchive.co.uk/documents/DoT_KX1987.pdf (accessed November 19, 2009).

- Prag, J. & Neave, R. (1997). *Making Faces: Using Forensic and Archaeological Evidence*. London: British Museum Press.
- Simcox, S., Wilkes, N. S., & Jones, I. P. (1992). Computer Simulation of the Flows of Hot Gases from the Fire at King's Cross Underground Station. *Fire Safety Journal* 18, 49–73.
- Stern, C. (1997). The King's Cross Fire. In *Dr Iain West's Casebook: The Chilling Investigations of Britain's Leading Forensic Pathologist* (pp. 153–163). London: Warner Books.

Piper Alpha Oil and Gas Platform Disaster, July 6, 1988

7

DEREK HILEY
SUE BLACK

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Introduction

Around 10:00 p.m. July 6, 1988, a fire broke out onboard the Piper Alpha oil and gas production platform following an explosion. The rig was located in the North Sea some 120 miles northeast of Aberdeen and stood in over 122 meters (400 feet) of water. Of the 224 men onboard at the time, 165 died as a result of the fire and the ensuing explosions, and only 59 survived. The death toll rose further when two crewmen of a rescue boat were also killed responding to the incident. To date, the Piper Alpha disaster remains the oil industry’s worst incident in terms of loss of life. Grampian Police were the responding force (Figure 7.1).

Background

In 1972, Occidental Petroleum (Caledonia) Limited (OPCAL) secured an oil exploration licence for the North Sea and later in the following year hit gold when they located the Piper oilfield. At its height in 1979, this production platform was producing 317,000 barrels of oil a day, more than any other platform had done in the past or has since been able to achieve. It was responsible for providing 10% of all UK oil and gas production from the UK sector of the North Sea. The four-module platform was constructed and the sections



Figure 7.1 Policing regions of Scotland with Grampian Police boundaries highlighted.

united at McDermott Engineering yard at Ardersier just south of Inverness, and were towed out to the North Sea on barges in 1975 ready for production to commence in late 1976.

The platform produced both crude oil and natural gas from 24 wells, and this was transferred to the Flotta oil terminal on Orkney, 128 miles away. Piper Alpha was also linked by pipelines to the Claymore (21.5 miles long) and Tartan (11.5 miles long) production platforms. A separate gas pipeline ran from Piper Alpha to a gas compressing platform MCP-01 around 30 miles to the northwest.

Every oil rig is patrolled by multisupport vehicles (MSVs) equipped to fight fires, kill oil wells, and provide support and hospital facilities in the event of an emergency. The Piper Alpha platform had a total of three support vessels patrolling the waters around the platform, the first of which was the *Tharos*, a \$100 million Japanese-built vessel that was self-propelled, twin hulled, semisubmersible, three stories tall, and supported by eight columns resting on two pontoons the size of submarines. The *Tharos* was accompanied by a smaller supply vessel, the *Maersk Cutter*, and also by the *Silver Pit*, a converted trawler.

Circumstances

Oil production platforms require constant renovation and repair, and during July 1988 each of the 300 pressure safety valves (PSVs) was being examined and tested. The last to be assessed, PSV 504, located some 5 meters (15–20 feet) above the floor of C module, was fitted to condensate injection pump A. Work was not completed before the end of the shift, so pump A was electrically isolated and a blind flange used to seal the pipe until the following day when the PSV would be replaced.

Condensate injection pumps are vital to the safety of an oil platform. Condensate is a form of liquid gas that rises onboard the platform, and the pumps ensure that it can be reinjected into the main oil line downstream of the principal oil pumps. The PSV within the condensate pump opens automatically if the liquid gas exceeds a preset pressure level allowing it a safe means of escape rather than allowing it to build up. Unfortunately, the necessary paperwork indicating the status of PSV 504 was not passed on to the next shift, so team members were unaware that it had been removed and not replaced.

At 9:45 p.m. a flashing light appeared on the central panel of the control room indicating that condensate injection pump B had tripped. After consulting maintenance paperwork indicating no issues for concern, a decision was made to switch to condensate injection pump A, and the electrical isolation was reversed. Almost immediately, there was a massive explosion, which tripped all the electrical power on the platform and meant that no alarms sounded. The bolts holding the flange in place within the pump had not held, and the pressurized condensate had escaped. As the starting mechanism for the pump had kicked in, an electrostatic spark ignited the condensate.

Since the platform had originally been built for oil production and later converted to oil and gas, the firewalls were designed to withstand fire but not explosion and had never been altered to reflect this change in production. The explosion ripped through the firewalls and dislodged panels around module B. One of these ruptured a small condensate pipe, and the contents were soon alight and spreading as a sea of burning oil.

Everyone onboard the platform heard or indeed felt the initial explosion, but, with the absence of alarms and no loudspeaker instructions regarding evacuation or emergency procedures, most assumed that there was little amiss. However, when smoke began to penetrate the accommodation blocks, it became clear that a serious event was unfolding. Emergency procedures required that personnel should make their way to lifeboat stations, but fire and smoke prevented them from doing this successfully. Many of the men moved back to the fire-proofed accommodation block beneath the helipad to wait for instructions. Others chose to jump the 53 meters (174 feet) overboard into the cold North Sea, where survival is impaired. Only

61 of those who jumped overboard survived—none survived in the accommodation block.

Ultimately, the fire would have burned itself out if it was not being continuously fed from both the Tartan and Claymore platforms. Both platforms continued to pump since no notice had been received from Occidental that it should cease; to shut down production was a major loss of revenue for the company and was not a procedure ordered lightly.

At 10:20 p.m. the pipeline from the Tartan field melted and ruptured, releasing 15–30 tons of gas pressurized at around 120 atmospheres, which immediately ignited and caused a ferocious fireball over 150 meters in diameter, visible from 85 miles away. The maximum temperature was likely to have been in the region of 2,000°C. It engulfed Piper Alpha, and in addition to vaporizing some of the men on Piper Alpha, it also killed two crewmen on the fast rescue boat that had been launched from the nearby support vessel. This second explosion then put increased pressure on the other gas line running to processing platform MCP-01. This line blew at 10:50 p.m., and the force of the third explosion could be felt over 1 mile away on nearby platforms. At 11:18 p.m. the gas riser from the Claymore field failed, causing the fourth explosion. This explosion ultimately resulted in the separation of the accommodation block (east replacement quarters (ERQ)), which sank over 130 meters (430 feet) to the seabed with more than 70 men trapped inside. By 12:45 a.m. the fire was contained on the surface of the sea. The entire platform had collapsed, and only module A remained (Figure 7.2). The blazing



Figure 7.2 Piper Alpha oil rig on fire. (Photo courtesy of ITN/Rex Features.)

remains of the platform were fully extinguished 3 weeks later by a team led by the infamous Texan oil firefighter, Red Adair.

Initial Response

An emergency distress was broadcast at 10:04 p.m. that there was an explosion and a fire onboard the Piper Alpha and that crewmen were abandoning the rig. At 10:06 p.m. a mayday was sent requesting assistance. At 10:08 p.m. a second mayday alert was issued that the radio room was being abandoned.

A message had been picked up at 10:02 p.m. by the onshore radio station at Wick from the vessel Lowland Cavalier that there had been an explosion on Piper Alpha, but the severity of the situation was not known. Information was relayed to Aberdeen, and a search and rescue (SAR) mission commenced via the Coastguard and the Maritime Rescue Coordination Centre (MRCC). At 10:19 p.m. a Nimrod was scrambled from RAF Kinloss to coordinate the radio transmissions from all air and sea craft that would be involved. At 10:22 p.m. the first Sea King helicopter lifted off from RAF Lossiemouth, followed 6 minutes later by one from RAF Boulmer. The Standing Naval Force Atlantic was on exercise in the North Sea and alerted its flotilla of frigates and destroyers to abandon exercise and to assist the emergency. A third Sea King lifted off from Shetland at 10:45 p.m. and a fourth from RAF Lossiemouth at 10:51 p.m.

Grampian Police was notified at 10:08 p.m., and Chief Inspector (of Police) Ian Gordon, head of the Criminal Investigation Department (CID), was tasked as the senior officer to coordinate what would be the required police response in Aberdeen, and in Orkney, and in relation to the Piper Alpha itself. Aberdeen Royal Infirmary at Foresterhill was placed on alert, and all burns and respiratory experts were called to assist.

The message received from Occidental by Grampian Police stated that this was “a diving incident,” but despite this, Grampian Police established a major incident room to act as a casualty bureau initially equipped with 12 telephone lines, later doubled to 24. Officers were deployed to Aberdeen Royal Infirmary and Aberdeen Airport to record casualty details. It was initially believed that this was a closed incident, although this was not strictly true as there had been transference of individuals between the platform and support vessels. Within 24 hours of the explosion, 174 police officers were deployed, and all next of kin had been informed.

The police mortuary at Queen Street in Aberdeen could hold only 12–15 deceased, and reports were filtering through that there may be many deceased as information on survivor numbers was grim. A dedicated emergency mortuary had been identified by the local council some time before, but it was in the middle of a housing estate, and Gordon believed that the press would

gain access to the flats that overlooked the mortuary and would be able to photograph the arrival and departure of the remains. Gordon was head of forensics in 1986 when a Chinook helicopter crashed on its return from the Brent oil field to Sumburgh in Shetland, killing 45 of the 47 persons onboard. On that occasion he had commandeered a hangar at the island's airport as a temporary mortuary, and it had worked exceptionally well. In agreement with the chief constable, Alastair Lynn, a similar situation was sought at Aberdeen Airport, and a hangar normally used for storing snow equipment was made ready as a temporary mortuary. Kenyon International Emergency Services was employed to assist with the morticians and the organization of personal effects, and Occidental agreed to meet all costs.

The role of family liaison officer did not formally exist at this time, and therefore officers with no specific training in this area were deployed to families to harvest as much antemortem (AM) data as possible. The initial approach was somewhat haphazard with early information comprising little more than descriptors, for example, height, build, hair color, and jewelry habitually worn. This resulted in repeated visits to families until it was directed that the most valuable AM data might be held by medical and dental practices.

Relatives had begun to arrive at the hospital and congregated in the chapel overlooking the helipad. The first Sea King carrying survivors touched down at 3:30 a.m., and over the next 3 hours 11 helicopter flights landed, carrying only 61 people, 21 of whom were admitted to the burns or plastic surgery units of the hospital. The story of the "ghost ship" was born that night and is a myth that still reverberates around Aberdeen's oil and gas community. Some families say they were told of a Russian trawler that had picked up between 80 and 90 survivors and were sailing for either Peterhead or Fraserburgh but that their radio had broken down so nobody could contact the vessel. This fictitious ship allowed false hope to survive for some of the families for a few more hours.

Victim Recovery and Identification

The marine department of Occidental was charged with the responsibility of locating and recovering bodies from the sea floor using specialized scanning equipment and remotely operated vehicles (ROVs). A total of 27 deceased were recovered from July 10 to 29. Thereafter, two fishing vessels were employed to trawl the sea floor, which yielded a further 10 deceased, recovered between October and November 1988, but this was a rather crude and unsuccessful means of locating victims and was subsequently halted.

The scanning operation undertaken by Occidental identified the location of the ERQ and confirmed that bodies were contained within, and divers



Figure 7.3 Raising the accommodation module of Piper Alpha oil rig after fire. (Photo courtesy of Sipa Press/Rex Features.)

initially retrieved seven deceased (Figure 7.3). However, the conditions were dangerous, and the potential for further loss of life was significant. Therefore, a decision was made to raise the structure from the seabed to facilitate continued recovery of the deceased. The ERQ was raised on October 15 and was transported by barge to Flotta in Orkney. The ERQ was fundamentally an inverted metal box comprising decks, all of which had to be gridded and searched. The decision was taken that divers would conduct the initial search of the ERQ; if a body was found, they would notify police officers, who would enter and recover the remains. A total of 23 police officers were deployed to Flotta and a further 48 to the temporary mortuary that had been established at Aberdeen Airport.

Police officers entered the ERQ in pairs, photographed the remains *in situ*, and attached a sequential unique reference number (URN) within a polythene bag. The remains were then placed into a body bag. Recovery officers were photographed with the bag for the sake of continuity. A cursory

preliminary search was undertaken to recover personal effects that might fast-track identification. The remains were then encoffined and transported by helicopter to the temporary mortuary at Aberdeen (some 280 miles away) for postmortem (PM) examination. A total of 74 bodies were recovered from the ERQ at Flotta, and the entire body recovery operation took 5 weeks to complete, with officers working each day from 8:00 a.m. to 8:00 p.m. By the time of completion, the deceased had been submerged for 12 weeks.

The mortuary facilities were basic, with little refrigeration capability or staff facilities. PM examinations were conducted by a team of local pathologists, led by W. T. Hendry of Aberdeen University. The procurator fiscal in charge of the identification operation was Alexander Jessop. Both he and Hendry agreed that no remains would be visually identified by families and that they should be allowed to view bodies only after they had been scientifically identified following completion of the disaster victim identification (DVI) process and were at the final encoffining stage. Police officers working in pairs were responsible for stripping, washing, photographing, and data matching. At one stage around 19 bodies were being examined per day. Cause of death was established in all but two cases with the majority of victims (109/167, equating to approximately 65%) dying as a consequence of smoke and toxic gas inhalation. A further 11 victims (7%) drowned, and 11 succumbed to injuries including burns; however, only 4 (2%) died of fatal burns. In total, 134 (80%) of the victims of the Piper Alpha tragedy were identified through odontological means under the guidance of Mr. Derek Clark and his team. The remainder were identified by clothing, personal effects, or physical descriptions, and some were primarily identified via tattoos and names on their survival and boiler suits. Fingerprints were not used as a means of identification, and DNA was not an accepted process at this time. At the end of the identification process, 167 deaths were confirmed; however, the remains of 30 victims were never recovered.

After the Event: Public Inquiry

A public inquiry was set up in November 1988, chaired by Lord William Douglas Cullen of Whitekirk. The subsequent two-volume report was published in 1990 (Cullen, 1990) and was a resounding condemnation on the health and safety procedures adopted by Occidental, although the Lord Advocate, Lord Fraser of Carmyllie, chose not to pursue any criminal charges. The inquiry concluded that the initial condensate leak occurred as a result of maintenance work being carried out simultaneously on both a pump and a pressure safety valve. Lord Cullen found Occidental guilty of inadequate maintenance and safety procedures and made 106 recommendations for changes to North Sea safety procedures, all of which were accepted

by the industry. The Piper Alpha incident was instrumental in bringing about the “Offshore Installations Regulations” (HSE, 1995; Office of Public Sector Information, 2005) that have become a vital component of health and safety operations in the North Sea.

Marks of Respect

A buoy marks the wreck where the Piper Alpha oil platform stood. A memorial sculpture was erected in the rose garden at Hazlehead Park in Aberdeen and shows three oil workers representing different roles in the industry: a roustabout, a man in a survival suit, and a central character who holds in his left hand a pool of oil sculpted in the shape of an unwinding spiral while his right hand points to the ground from where the oil has come. The name of each of the victims is inscribed on the memorial; more poignantly, buried underneath are the ashes of some of the deceased. In 2008, in recognition of the 20th anniversary of the disaster, the chief executive of Aberdeen Performing Arts commissioned a stage play, *Lest We Forget*, that was performed in Aberdeen in the week leading up to the anniversary of the night when 167 men lost their lives (Figure 7.4).



Figure 7.4 Memorial to those who died on Piper Alpha. (Photo courtesy of CAHID.)

References

- Cullen, W. D. (1990). *The Public Inquiry into the Piper Alpha Disaster* (two-volume set). London: Department of Energy, HMSO.
- Health and Safety Executive. (HSE). (1995). Health and Safety Executive, Offshore Installations and Pipeline Works (Management and Administration) Regulations 1995: Guidance on identification of offshore installations. Available from http://www.hse.gov.uk/offshore/notices/on_39.htm (accessed May 3, 2010).
- Office of Public Sector Information. (2005). Offshore Installations: The Offshore Installations (Safety Case) Regulations 2005. Available from <http://www.opsi.gov.uk/si/si2005/20053117.htm> (accessed May 3, 2010).

The Lockerbie Bombing, December 21, 1988

8

GRAEME GALLOWAY
XANTHÉ MALLETT

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Introduction

On Wednesday, December 21, 1988, at 6:25 p.m., Pan-Am Flight 103 “Maid of the Seas” took off from London Heathrow Airport en route from Frankfurt bound for J.F. Kennedy Airport in New York with a designated flight path over Scotland. At 7:02 p.m., the Boeing 747 was given oceanic clearance from Shanwick Ocean Control, but the transmissions were not acknowledged. Flight 103 disappeared from radar screens at this time, and no further radio communications were received. Multiple primary radar returns were then seen fanning out downwind for a considerable distance. At 7:03 p.m., while at 31,000 feet, the plane had exploded over the Scottish town of Lockerbie due to an improvised explosive device (IED) concealed in the cargo hold. All 259 persons onboard were killed, including 243 passengers and 16 crew, as were 11 residents of the town from falling debris onto a residential area. The victims represented 21 nationalities, the average age being 27 years.

Lockerbie is a small, rural market town and at the time of the incident had a population of approximately 3,500. Dumfries and Galloway Constabulary (Figure 8.1) was the responding force, and in 1988 it was and still remains numerically Britain’s smallest police force, with only 345 officers at that time. There were only four police officers on duty in Lockerbie: two beat officers and a double-crewed traffic car. At 7:04 p.m. the police received the first emergency telephone report from a local resident in Lockerbie that there had been a loud explosion and the town was “engulfed in flames” (Emerson and Duffy, 1990). Other eyewitness reports described a noise like thunder rapidly increasing to deafening proportions, and when the plane impacted with the town a seismic



Figure 8.1 Policing regions of Scotland with Dumfries and Galloway Constabulary boundaries highlighted.

monitoring station approximately 15 miles away in Eskdalemuir registered a shock wave measuring 1.3 on the Richter Scale. One week postincident, Mick Charles of the Air Accident Investigation Branch (AAIB) announced via the world's press that traces of high explosive had been found on a luggage container believed to have been in the plane's hold. The explosion blew a hole in the airline's outer skin, although evidence suggests that the explosion within the fuselage itself (Figures 8.2 and 8.3) would have been insufficient to have killed all persons onboard. This incident became known as the Lockerbie disaster, and as it was the result of terrorist activity it led to Britain's largest mass murder investigation.

Since the introduction of legislation including the Freedom of Information (Scotland) Act 2002 (Office of Public Sector Information, 2002), there has naturally been significant and intense interest in all aspects of the investigation. The trial records have placed the majority of the evidential process in the public domain, which are consequently a rich source of information (Dumfries and Galloway Constabulary, n.d.). However, the case remains live, and although the investigators endeavor to respond openly to

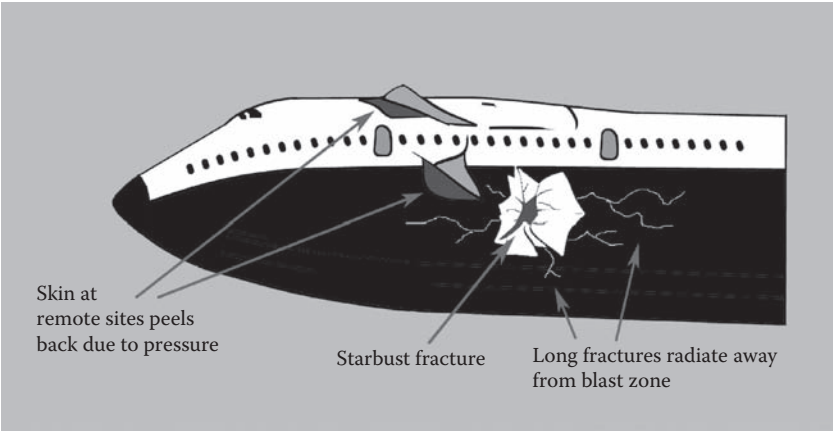


Figure 8.2 The relative position of the damage to the plane’s outer skin caused by the IED, which was located within a container on the left side in the forward hold.



Figure 8.3 Luggage container in which the IED was hidden. (Photo courtesy of Dumfries and Galloway Constabulary.)

requests for information there are limits on what information can be made publicly available.

Circumstances

Prior to 1988, targets of terrorist attacks were airports, aircraft, and major cities such as London, Birmingham, and Manchester. As a consequence, investigators had developed the expertise to deal with such incidents—resources that a small Scottish town such as Lockerbie would simply not have at its disposal. The resulting investigation had two main focuses: (1) search for survivors; and (2) the recovery of all evidence for counterterrorism. Consequently, although the care for and dignity of the deceased was extremely important, the importance of the ensuing criminal investigation to establish the cause of the incident became imperative.

The plane departed late for its destination, a fact that would significantly impact the recovery operation; if it had taken off on time, it would have been over the Atlantic Ocean at the time of detonation. However, at 7:03 p.m. Pan-Am Flight 103 was not over the Atlantic but was instead passing over the town of Lockerbie, which is situated approximately 25 miles north of Carlisle and 12 miles east of Dumfries. Precisely at this time, the plastic explosive concealed in a radio cassette player in luggage container AVE 4041 situated on the left side of the forward hold exploded. The suitcase later identified as containing the IED was among pieces of baggage transferred from Pan American Flight 103A, which had been unaccompanied both on the flight from Frankfurt to Heathrow and on the flight from Heathrow (Mowat, 1991).

Having only recently left Heathrow Airport for a transatlantic flight, the plane was carrying almost a full load of jet fuel in the left wing of the plane. The fuel was ignited midair, and eyewitnesses report seeing a fireball falling from the sky. The entire left wing of the plane landed to the east of Lockerbie in Sherwood Crescent (Figures 8.4 and 8.5). The impact occurred at around 500 miles per hour and left a crater 47 meters long and 560 cubic meters in volume (AAIB, 1990a). A debris trail measuring 130 km extended to the east coast of England (AAIB, 1990a). The weight of the material displaced by the wing impact is estimated to have been in excess of 1,500 tons. Upon impact, a fireball several hundred feet across followed, with lighter debris being carried several miles downwind, while larger debris caused additional fires including a major fire 350 meters away at Townfoot Garage. A gas main was also ruptured on impact when the wing landed, exacerbating the already serious fire danger: This was a residential area, where several families lived.

The total area of the crash scene on the ground covered some 845 miles.² An 18 meter (60 foot) section of the lower rear fuselage with 60 bodies inside landed between two rows of houses at Rosebank Crescent, miraculously



Figure 8.4 Aerial view showing crater in Sherwood Crescent. (Photo courtesy of Dumfries and Galloway Constabulary.)



Figure 8.5 Crater in Sherwood Crescent. (Photo courtesy of Dumfries and Galloway Constabulary.)



Figure 8.6 Damage to housing in Rosebank Crescent. (Photo courtesy of Dumfries and Galloway Constabulary.)



Figure 8.7 Damage to housing in Rosebank Crescent. (Photo courtesy of Dumfries and Galloway Constabulary.)



Figure 8.8 Cockpit *in situ* at Tundergarth village. (Photo courtesy of Dumfries and Galloway Constabulary.)

missing them all. All four engines struck the ground in Lockerbie town with considerable velocity, penetrating road surfaces and severing a water main. The flight deck and forward fuselage were found with the flight crew at Tundergarth Farm, near Tundergarth village (Figures 8.9 and 8.10), 3 miles east of Lockerbie, having fallen flat on its left side. Bodies literally rained down over the town of Lockerbie. The gardens in and around the area were strewn with victims in addition to personal property and debris associated with the aircraft, such as lifejackets and passenger luggage. Smaller items of debris were strewn across the east coast of England.

Having lost cabin pressure following the explosion at 31,000 feet (approximately 6 miles), the aircraft broke into pieces on descent. Many of the passengers and crew would have been rendered unconscious due to the loss of pressure, and their lungs, having expanded to four times their normal volume, would have subsequently collapsed. The air temperature would have been around -46°C . It would have taken 2 minutes for Pan-Am Flight 103 to fall 31,000 feet. The emotional response of the bereaved relatives and general public was made worse due to media reports that some victims were in all probability conscious during the descent.

The town's general utilities such as gas, electricity, water supply, and telephone communications were all rendered inoperative by the disaster, and a number of key trunk roads became impassable. In addition to the sites within Lockerbie town itself and Tundergarth village, numerous other scenes required police security to preserve the evidence, for example, the golf course and an area known as Lambhill. Officers were dispatched to both areas to protect them, but the availability of police resources meant they were not able



Figure 8.9 Aerial view of Tunfergarth village showing cockpit in situ. (Photo courtesy of Dumfries and Galloway Constabulary.)



Figure 8.10 Reconstruction of the aircraft in progress. (Photo courtesy of Dumfries and Galloway Constabulary.)

to secure all of the microscenes. All sites were strewn with bodies and body parts as well as debris from the plane itself. Victims left *in situ* for extended periods of time, in full view of the public, added to the traumatic nature of the event. As a result, residents helped tend to the deceased by covering them with blankets. While this response is understandable, it does highlight the problem of scene and evidential contamination.

Multiple fires were identified, and during the initial phase 15 firefighting appliances were deployed from various brigades. At 10:09 p.m. the fire master reported a series of fires covering an area of the town extending more than 1 mile. As the water supply had been interrupted, water was being brought to the town by other appliances, increasing the number of attending fire appliances to 20 overnight.

Dumfries and Galloway Council's regional peacetime emergency plan was implemented. This plan called upon many organizations and individuals and involved international agencies, central government, public services, the armed forces, the private sector, voluntary organizations, and the community at large in the recovery effort, a situation known as "mutual aid." Dumfries and Galloway Constabulary was reinforced by contingents from many other forces including the neighboring Strathclyde and Lothian and Borders constabularies. Resources from Her Majesty's (HM) forces, Royal Air Force (RAF) Boulmer, and RAF St. Athan were authorized as military aid, including provision of military personnel and a number of helicopters which were used mainly in the search and recovery (SAR) of aircraft wreckage. During the early days of the emergency operation being mounted, Lockerbie's population grew from around 3,500 to 10,000.

Mutual aid, however, cannot be provided instantaneously and did not begin until the day following the disaster (December 22, 1988) and lasted until January 5, 1992 (a total of 3 years and 1 month), with 1,100 police personnel from 12 UK forces, 1,000 military personnel, rescue and emergency services, volunteer agencies, and civilian forces all attending. All of the groups required coordinating, another challenge of the operation. The initial response was done with all good intentions but was difficult to manage as the incident preceded the implementation of the role of senior investigating officer (SIO), whose job was to control and coordinate all parties and to whom all would have been accountable. Essentially, there were no reactive contingency plans in place at that time for application in an event such as this.

Police control of the scenes appeared to have been difficult to establish, and not all scenes were immediately evacuated to reduce scene contamination and preserve evidence. No cordon was established, and as a result there were reports of relatives of the local victims having access to, and sifting among, the debris. A security cordon would also have prevented scene disturbance and would have reduced the press intrusion, which became a significant problem.

The response by the emergency services occurred as follows:

- 7:03 p.m.: The police patrol in Lockerbie radioed Dumfries and Galloway Constabulary force control room reporting an aircraft crash at Lockerbie. Officers as far away as Glasgow (70 miles) were mobilized.
- 7:04 p.m.: Fire brigade and ambulance control centers received the first call from the public. Ambulances were mobilized from across Scotland and Cumbria.
- 7:07 p.m.: The first fire appliances were mobilized; at 7:10 p.m. one was in attendance in the Rosebank area where approximately 60 bodies were located, that had landed on top of houses and within gardens.
- 7:37 p.m.: The first casualties arrived at Dumfries and Galloway Royal Infirmary 20 miles away.
- 7:40 p.m.: Sherwood Park and Sherwood Crescent residents were evacuated to Lockerbie town hall.
- 8:25 p.m.: The flight deck/nose section was discovered at Tundergarth Farm; approximately 20 bodies remained within this section.

The world's media was intensely interested in the event and the aftermath, as individuals representing 21 nationalities were involved, with the majority originating from the United States. Pressure on the investigators to provide answers was immense, and no local precedent could have prepared the Lockerbie area for media management on this scale. Problems were encountered at Sherwood Crescent, Tundergarth village, the golf course, as well as Lambhill, with single officers guarding the scenes having great difficulty preventing the photography of the victims and dismembered body parts.

During the initial early and chaotic hours of the disaster, the chief constable (CC), John Boyd, stated that his main objective was to "complete the search for any survivors and recover the bodies of all victims if possible by 11:59 p.m. on Christmas Eve, Saturday, December 24, 1988." Of the 270 victims, 240 had been recovered by that time (Emerson and Duffy, 1990). In addition, a number of key principles were also established at this point, namely, (1) the accuracy and coordination in the gathering of production and evidential material whether bodies, aircraft parts, or other property; (2) the proper timing of the release of any relevant information to the media or any other party; and (3) the proper diplomatic channels to be used when enquiries were to be carried out overseas.

Victim Recovery and Identification

This incident was both open, as deceased victims on the ground were unknown, and closed, as there was a complete flight manifest for those

victims from the plane. Body recovery became a priority, and the task was predominantly undertaken by the police with the assistance of RAF St. Athan and volunteer mountain rescue teams. The total search area for body and property recovery comprised approximately 845 miles,² stretching from Lockerbie eastward to the North Sea, much of which was remote upland and forested areas. Buildings and areas in and around Lockerbie were designated for specific purposes within the investigation. For example, Lockerbie Academy was the base for the SAR organization, the local ice rink was used as a body-holding area, the ground floor of the town hall was turned into an information and casualty bureau, and the first floor of the hall was used as a temporary mortuary. This allowed officers from Dumfries and Galloway Constabulary to be deployed to deal with local issues. The bureau received over 2,500 calls of persons reported missing.

In all, 11 search sectors were established (Table 8.1). A number of search teams were allocated to each sector, and each team had an assigned doctor. At the subsequent fatal accident inquiry (FAI), held under Section 6 of the Fatal Accidents and Sudden Deaths Inquiry (Scotland) Act 1976 (Mowat, 1991) amended in 2007 (Office of Public Sector Information, 2007), Sheriff Principal John Mowatt of the Queen’s Council found that “the primary cause

Table 8.1 11 Search Sectors

Sector	Name	Area (Miles ²)	Description	Body Recovery
A	Sherwood	31.27	Included Sherwood Crescent	25 (including all residents of Lockerbie)
B	Rosebank	0.58	Residential housing	61
C	Beechgrove	11.02	North of Lockerbie, including golf course	43
D	Tundergarth	27.21	East of Lockerbie, where the cockpit section of the plane was recovered	106
E	Halldykes	7.12	West of Lockerbie, mostly farmland	27
F	Balstack Farm	25.87	Farmland	0
G	Cadgill	55.06	Upland farmland	0
H	Haggyhill	37.06	Upland moor land	0
I	Newcastleton	194.9	Scottish borders, mostly forested	0
J	North Cumbria	126.22	Farmland	0
K	Northumberland	328.87	Kielder Forest and parts Northumbria	0

Source: Mowat, J., available from www.gla.ac.uk:443/lockerbie/leg/Fai_1.rtf (2010), 1991, p. 11.

of the said deaths was a criminal act of murder ... from injuries sustained either as a direct result of the explosion and the disintegration of the aircraft or from impact with the ground" (ibid., p. 11).

The majority of the bodies were found in areas indicating they had been thrown from the fuselage during disintegration of the aircraft during descent. Although the pattern of distribution of bodies on the ground was not definitive, there was some degree of correlation with seat allocation as suggested by the flight manifest. This suggested to the AAIB that the forward part of the plane had broken away from the rear early in the disintegration process (1990a).

Each body or body part was photographed *in situ* by the search team, from the front, back, and facial views where appropriate, together with any obvious personal identification marks. Medical personnel worked with each team to pronounce life extinct. Each body or part was then given a sector number (e.g., C14) and a six-figure grid reference number on a label attached to the remains. A full description was also included on a victim identification form before the body was removed to the temporary mortuary in Lockerbie.

Much of the property recovered was treated with the same procedure: photographed *in situ*, labeled according to location, and removed for forensic examination to a disused warehouse within Lockerbie where it was lodged at a premises known as Dexstar. Here it was searched and assessed in an attempt to establish the identity of the owner. Luggage keys were matched to luggage, and camera films were processed and examined to assist in the identification of clothing worn by victims. Similar procedures were enacted for plane wreckage recovered, although this was removed to a Ministry of Defence (MOD) base in Cumbria where it was examined by the AAIB. In total, in excess of 11,000 items of personal property and wreckage were recovered, including 95% of the aircraft (Figures 8.10 and 8.11).

The bodies were taken approximately half a mile to the temporary mortuary, which was located on the first floor of the town hall. On arrival at the mortuary, the body or body part was given a mortuary number (e.g., 114 C14) indicating the sequential number that body or part represented and the site from which it originated. The disaster victim identification (DVI) process began with an initial examination, undertaken prior to the full postmortem (PM) examination. After the PM exam, the body or part was rephotographed in any clothes remaining; then all clothing was stripped and the body or part was photographed, and all elements were radiographed. Full descriptions of any clothing present were added to the victim identification form as well as a full physical description of the body or body part. All clothing was seized as productions. After this initial examination two pathologists carried out a PM investigation before the body or part had any additional data harvested, such as finger or palm prints and odontological examination. The body or part was then embalmed. A problem that arose during this process was that the



Figure 8.11 Rosebank Crescent, showing aircraft seating. (Photo courtesy of Dumfries & Galloway Constabulary.)

forms in use were found to be too small and lacked sufficient detail to record all relevant information, as they predated the current Interpol postmortem (pink) forms.

The temporary mortuary was established immediately at Lockerbie town hall, a large building in the center of town with two entrances—one at the front and one at the side. This venue quickly proved to be unsuitable as it was too small with room for only 80 victims, and its location made it difficult to access. In addition, there was a steep staircase with no lift; a pulley system was devised to assist in movement of the victims between floors for post-mortem examination. Further problems were encountered when the wooden floor started to warp. The body bags being used also proved unsuitable for disrupted remains as there were no carrying handles and they did not open flat for ease of use. This building was also being used as a casualty bureau on the ground floor, meaning that worried and grieving relatives were within the immediate vicinity of the deceased.

On December 25, 1988, the temporary mortuary was relocated to Lockerbie ice rink. This site was much larger than the town hall and had a large car park immediately adjacent to the building. It was also easier to secure, and there were on-site facilities for staff welfare such as refreshments. Additional anterooms were suitable for use as PM examination rooms. Bodies were stored on tarpaulins laid directly on the ice, which helped to slow

decomposition. However, this led to some elements freezing; consequently, wooden pallets supplied by local haulage companies were placed under the tarpaulin on top of the ice, allowing the bodies to remain cold without actually freezing.

Identifying the victims was of paramount importance, and assistance from the Federal Bureau of Investigation (FBI) was particularly important for the American victims; of the 259 aircraft victims, 189 (approximately 73%) were US citizens. Fingerprint files from criminal, civil, and military records were all sent to Lockerbie via the FBI headquarters in Washington, D.C. In addition, the FBI was able to supply a prototype photo-televis machine, then one of only two in existence, which was able to make exact color copies of any articles, particularly jewelry, watches, and rings, and to transmit the resultant images direct to the United States or other country if required (Knox, 1989).

The chief constable, in conjunction with the procurator fiscal, made a policy decision that no visual identification by a relative should take place, although this did occur in a very limited number of instances. Identification by DNA was considered; however, a policy decision was taken not to pursue this due to time and economic constraints and to avoid further distress to the families. Remember that in 1988 the use of DNA was in its infancy. The following methods of identification were used for 253 of the victims:

- Odontology only = 18
- Fingerprints only = 13
- Odontology and fingerprints = 78
- Odontology and other methods = 113
- Fingerprints and other methods = 17
- Visual only = 5
- Photographs, jewelry, other methods = 9

Other methods, although acknowledged as less reliable, included matches to luggage, documents in a person's possession, identifiable jewelry, and medical records. Today, these would be considered as secondary or tertiary methods of victim identification but were used solely in nine of the identifications after the Lockerbie disaster (Moody and Busuttill, 1994).

In total, 253 bodies or body parts were recovered, identified, and returned to next of kin. Eight individuals were classified as missing, presumed dead through multiple injuries caused by the plane crash and likely vaporized as a result of the ignition of the aviation fuel. These individuals had been allocated seats in rows 23–28, at the front of the economy section over the wing that struck Sherwood Crescent. The fragmented remains of 13 passengers who had been allocated seats around the 8 missing people were located in or near the crater formed by the left wing when it landed in Sherwood Crescent, Lockerbie. Although there remains no unequivocal proof that the missing

individuals remained associated with the wing structure until impact, this has been suggested as a reasonable course of events by the AAIB (1990b). Of the 11 Lockerbie residents killed, the bodies of 4 local people were located and identified, while seven other local victims were classified as missing, presumed killed through multiple injuries, and probably vaporized as with the missing aircraft place victims in the area of Sherwood Crescent where only a crater remained. In total, 678 bags of human tissue and body parts were recovered but not identified.

After the Event

From the outset of the disaster response, the Lockerbie Incident control room had to wrestle with many issues. Initially, the macroscale of the incident—covering an area of 845 miles²—caused serious problems in terms of resources and available manpower, together with the loss of services, including telephone communications resulting in information from the public witnesses and service agencies not being received by the emergency responders during the early crucial stages of the incident. In addition, December 21 represented the winter solstice and consequently the shortest period of daylight hours with which to conduct the recovery and investigation; low temperatures and high winds were an additional problem. Finally, as power supplies had been cut off, police officers were forced to search by torchlight for bodies, some of which were located in very remote areas of countryside.

Once mutual aid was enacted the day following the incident, the pressures on resources were alleviated; however, coordination among all of the assisting agencies became a problem. In addition, there was no clarity of responsibilities among the agencies and no harmonization between central and local government agencies. This is not surprising considering the extensive resources that descended on Lockerbie, together with the small size and lack of suitable experience of the host force to coordinate an incident of this magnitude. It must also be remembered that 21 different nationalities were represented by the victims.

A major problem occurred with the numbering of the deceased, as evidenced by one of the doctors working with the recovery teams whose job was to pronounce life extinct. Dr. David Fieldhouse counted and issued numbers to the deceased by attending one body, labeling it, and moving on to the next, with full recovery being undertaken by other parties. How and by whom this process was documented and recorded was the cause of considerable controversy during the following investigation, as official papers note that only 58 bodies were tagged by Fieldhouse, whereas his evidence suggests he counted 59. The question arose as to whether Fieldhouse made a genuine mistake, although he does not believe this to be the case. Clearly, this is a

huge problem for a recovery team and would put considerable doubt in the mind of any agency investigating the incident in regard to evidence presented during any subsequent inquiries.

The initial problems with the temporary mortuary were quickly resolved with the selection of a replacement site. However, consideration should have been given to the stigma that could become attached to the local venues following their use, although there is no evidence to suggest that this occurred in this case. While at the time the ice rink in particular may have been considered a suitable venue in terms of location and attributes, it would seem no consideration was given to the use of adjacent fields and areas within the outer cordon. However, given the scale of the disaster most of Lockerbie and surrounding areas were in many respects considered as crime scenes, and it may simply have not been possible to erect a temporary mortuary of the size required in the time available. In addition, Scotland in winter would have posed its own problems in having a mortuary facility based outside. Today, the National Emergency Mortuary Arrangements (NEMA) would most likely be employed in an incident such as this, avoiding the use of a preexisting building and therefore the associated problems experienced in Lockerbie.

Problems with unauthorized photography of victims at all four main crash sites would have been significantly alleviated if secure manned cordons had been implemented together with army tenting. It is acknowledged, however, that due to the scale of the incident, geography of the area, and actual resources available this would have been extremely difficult to achieve successfully given the speed of the world's media descending on Lockerbie. Had this been undertaken, however, the recovery, labeling, and authorized photography of victims *in situ* would have been more expedient and press intrusion minimized.

Collection, storage, and matching of antemortem (AM) and PM data were immense tasks, undertaken on a system not as efficient as those seen today. In addition, although all recovered bodies were eventually identified, one instance of information mismanagement resulted in an error when repatriating two of the victims. This mistake was quickly rectified and a personal apology immediately made to the families involved, but it did cause considerable embarrassment. This can also lead to a lack of trust in the whole identification process, as a consequence of which this situation must be avoided through the use of only reliable primary identification criteria (i.e., DNA, fingerprints, odontology, or unique medical condition [UMC]).

A decision was taken by the CC and the procurator fiscal that, due to the high level of fragmentation, families would not normally be allowed to view the bodies in an attempt to protect the families from further psychological trauma. Following Lord Justice Kenneth Clarke's inquiry report into the identification of victims following major transport accidents (Clarke,

2001b), it is now commonly accepted that families have a right to view the body of their loved one if they so wish (Clarke, 2001a) and that this is important for the future psychological well-being of the families (Disasteraction.Org.UK, 2008).

The Scottish police quickly built a relationship of trust with the victims' families due to their honest and open approach. This was of benefit in this incident as the victim recovery was slow due to unavoidable circumstances such as locations of the bodies and health hazards at the scene. Fires and debris aside, the aircraft had been transporting 1 million sewing machine needles, which landed with the fuselage in Rosebank Crescent. A number of officers received minor injuries. The problem was resolved by laying a very large tarpaulin along the entire site, but this solution impacted other aspects of the recovery and investigation.

Thousands of pieces of wreckage were recovered, totaling 95% of the entire aircraft, and as a result experts from the AAIB were able to reconstruct and examine debris and to identify what caused the crash and what happened to the aircraft and the individuals within. Specifically, two of the exhibits found proved pivotal in the subsequent investigation. The first of these was a piece of clothing with a design label, which led to the identification of those believed to be responsible for placing the explosive device on the aircraft. The second was a fragment of circuit board belonging to the device itself, which was recovered from a Slalom shirt by Thomas Hayes of the Royal Armament Research and Development Establishment (RARDE). Hayes was one of the principal scientists involved in the police investigation.

The recovery and identification element of the Lockerbie air disaster was considered to be very successful, following the intense scrutiny of international governments and media. As a result of the procedures used during the operation, several measures have been implemented or updated in the Association of Chief Police Officers (ACPO) forms to provide continuity and integrity of victims throughout the recovery, PM, and repatriation processes.

Conclusion

A memorial now stands at Dryfesdale Lodge Visitor's Centre, which serves as a tribute to those who lost their lives, as well as the community (Figure 8.12).

The Lockerbie incident remains contentious to this day. On January 31, 2001, Abdel Baset al-Megrahi was convicted of the murder of 270 passengers and persons on the ground when Pan-Am Flight 103 exploded over Lockerbie on December 21, 1988 (Mcqueen and Wortlet, 2008) and was sentenced to life imprisonment with the recommendation that he serve a minimum of 20 years before he could be considered for parole (Boyd, 2001). He remains the only individual ever convicted as a result of the Lockerbie disaster.



Figure 8.12 Memorial to those who lost their lives in the Lockerbie plane crash. (Photo courtesy of CAHID.)

In 2002, a panel of five Scottish Judges refused al-Megrahi's appeal against his conviction. However, on May 31, 2004, he was granted leave to appeal against his 27-year sentence. On June 28, 2007, the Scottish Criminal Cases Review Commission (SCCRC) concluded its 4-year review and referred the case to the High Court. The referral was based on six grounds, mainly relating to evidence that, for various reasons, was not heard at trial and that potentially indicated that a miscarriage of justice may have occurred. Of the six grounds for referral, four were the result of the commission's own inquiries as opposed to submissions made on behalf of the applicant (McQueen and Wortlet, 2008).

Regardless, following two appeals, on August 20, 2009, al-Megrahi was released on compassionate grounds, as a result of doctors' reports that he suffered from terminal prostate cancer. This decision was undertaken by Cabinet Secretary for Justice Kenny MacAskill on behalf of the Scottish government and has caused controversy all over the world, particularly in America where the decision was denounced.

References

- Air Accidents Investigation Branch. (AAIB). (1990a). Aircraft Accident Report No 2/90 (EW/C1094): Report on the Accident to Boeing 747-121, N739PA at Lockerbie, Dumfriesshire, Scotland, December 21, 1988. Available from <http://dnausers.d-n-a.net/dnetGOjg/Lockerbie.htm> (accessed May 3, 2010).
- Air Accidents Investigation Branch. (AAIB). (1990b). Report No: 2/1990: Report on the Accident to Boeing 747-121, N739PA, at Lockerbie, Dumfriesshire, Scotland, December 21, 1988. Available from http://www.AAIB.gov.uk/cms_resources.cfm?file=/2-1990%20N739PA.pdf (accessed May 3, 2010).
- Boyd, R. H. (2001). Politics, Crime and Criminal Justice: The Lockerbie Trial. International Society for the Reform of Criminal Law. Available from <http://www.isrcl.org/Papers/Boyd.pdf> (accessed May 7, 2010).
- Clarke (2001a). Marchioness/Bowbelle: Formal Investigation under the Merchant Shipping Act 1995. Available from <http://www.marchioness-bowbelle.org.uk/> (accessed February 5, 2009).
- Clarke (2001b). Public Inquiry into the Identification of Victims following Major Transport Accidents. Department of the Environment, Transport and the Regions.
- Disasteraction.Org.UK. (2008). Disaster Victim Identification: Issues for Families and Implications for Police Family Liaison Officers and Coroner's Officers. Available from http://www.disasteraction.org.uk/leaflets/Guidance_for_Responders_Disaster_Victim_Identification_Issues_for_Families_and_Implications_for_Police_Family_Liaison_Officers_and_Coroners_Officers.htm (accessed May 3, 2010).
- Dumfries and Galloway Constabulary. (n.d.). Lockerbie Air Disaster. Available from <http://www.dg.police.uk/news/highProfile/lockerbie.htm> (accessed May 7, 2010).
- Emerson, S. & Duffy, B. (1990). *The Fall of Pan Am 103*. Futura.
- Knox, B. (1989). The Grim Search Continues. *Police Professional*, January.
- Mcqueen, H. & Wortlet, S. (2008). Lockerbie Trial Verdicts: (769) Lockerbie Appeal—No Decision Yet on Document Disclosure. Available from <http://www.law.ed.ac.uk/sln/blogentry.aspx?blogentryref=6700> (accessed May 3, 2010).
- Moody, G. H. & Busuttil, A. (1994). Identification in the Lockerbie Disaster. *American Journal of Forensic Medicine and Pathology*, 15, 63–69.
- Mowat, J. (1991). Sheriffdom of South Strathclyde, Dumfries and Galloway Determination by Sheriff Principal John S. Mowat QC in the Fatal Accident Inquiry relating to the Lockerbie Air Disaster. Available from www.gla.ac.uk/443/lockerbie/leg/Fai_1.rtf (accessed May 3, 2010).
- Office of Public Sector Information. (2002). Freedom of Information (Scotland) Act 2002. Available from http://www.opsi.gov.uk/legislation/scotland/acts2002/pdf/asp_20020013_en.pdf (accessed May 7, 2010).
- Office of Public Sector Information. (2007). The Fatal Accidents and Sudden Deaths Inquiry Procedure (Scotland) Amendment Rules 2007. Available from http://www.opsi.gov.uk/legislation/scotland/ssi2007/ssi_20070478_en_1 (accessed May 3, 2010).

The Hillsborough Football Stadium Disaster, April 15, 1989



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Introduction

On Saturday, April 15, 1989, the worst disaster in English football history occurred in terms of loss of life. In total, 96 men, women, and children died as a result of events on that day, the youngest being just 10 years old. At approximately 3:00 p.m., at the Football Association’s (FA’s) semifinal match between Liverpool and Nottingham Forest, football fans died from crush-related injuries, and 766 were injured. This mass fatality event occurred at Hillsborough Football Stadium in Sheffield. South Yorkshire Police were policing the event and already engaged in crowd control, as thousands of fans were expected to attend the stadium as a result of the match. The ground had been used as the venue for the FA Cup semifinal the year before involving the same teams, and the fixture had been played without any significant crowd problems. Due to the high level of staff required, it was necessary to have plain-clothed police officers working in uniform to provide additional staff. On an occasion such as this (with approximately 54,000 spectators expected), the policing operation was complex. In all, some 1,122 police officers were deployed that day—almost 38% of South Yorkshire Police’s personnel (Figure 9.1). Included in the mounted section of 34 were officers from Liverpool and Nottingham, who were present to assist with marshaling their own supporters. Sheffield Wednesday Football Club provided 376 stewards, gate staff, and turnstile operators on the day (Taylor, 1989).



Figure 9.1 Policing regions of England with South Yorkshire Police boundaries highlighted.

Circumstances

Hillsborough Stadium in Sheffield is the home ground of Sheffield Wednesday Football Club (Figures 9.2 and 9.3). Built in the late nineteenth century in typical Victorian style, the area to accommodate fans consisted of two large separate two-tiered stands and two single-tiered stands, all of which were covered. The South Stand was the largest and the West Stand the smallest. Access onto the pitch was prevented by steel fencing, erected as a consequence of football hooliganism during the 1970s and early 1980s and designed to prevent large-scale pitch invasions. On April 15, 1989, the Liverpool supporters were allocated the West Stand, colloquially known as “Leppings Lane” terrace, with a capacity of approximately 10,000 people. Previously, when the same two teams had met, Liverpool fans had been accommodated in the larger “Spion Kop” end of the ground. It has been suggested that on this occasion the placement of fans was changed due to the direction from which most

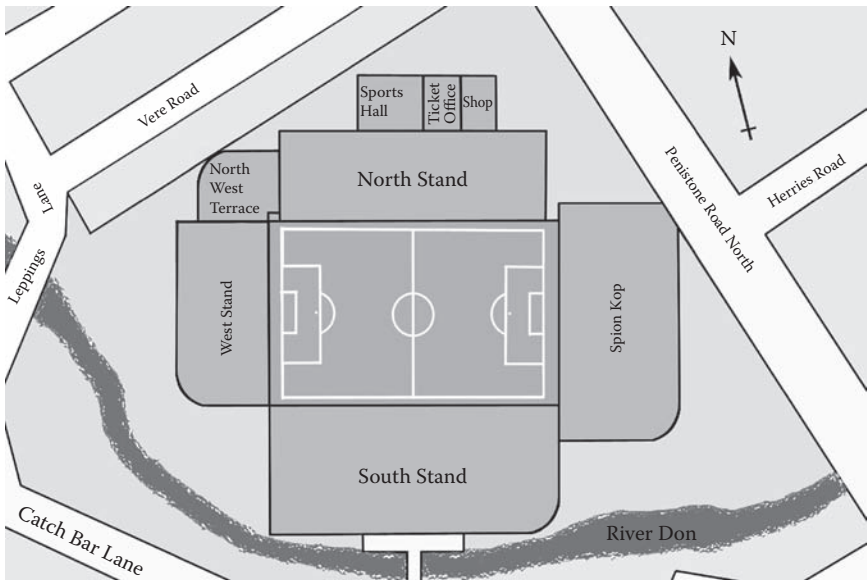


Figure 9.2 Illustration showing the layout of Hillsborough Football Stadium. (Adapted from http://en.wikipedia.org/wiki/File:Hillsborough_Stadium_Plan.png.)

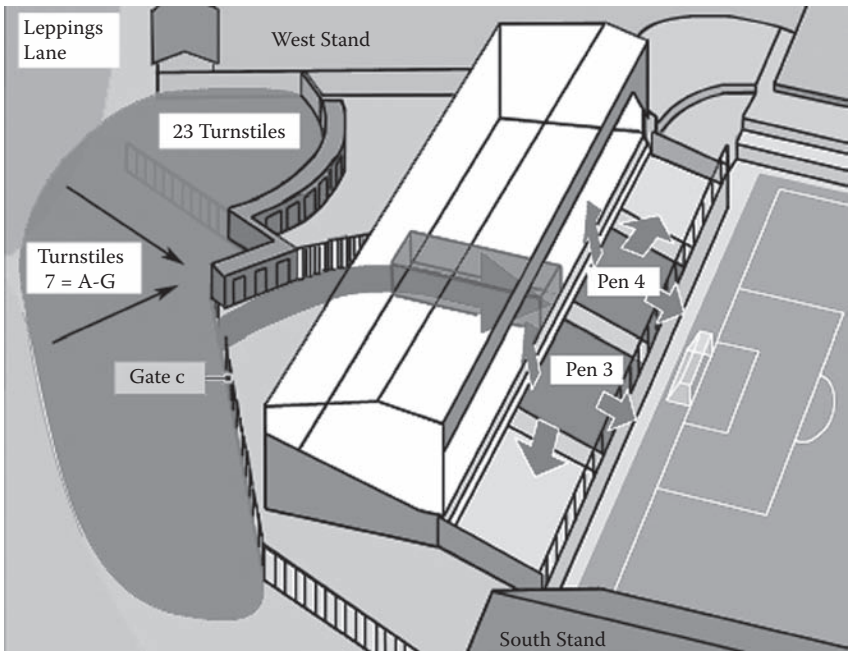


Figure 9.3 Illustration showing the layout of Hillsborough Football Stadium, including the positions of the turnstiles and pens. (Adapted from <http://news.bbc.co.uk/1/hi/uk/7992845.stm>.)

fans would be traveling; the new arrangement ensured that rival fans did not have to cross paths either prior to or after the match, thereby reducing the potential for crowd trouble.

On match day, the Leppings Lane end of the ground had a total of 23 turnstiles to allow entrance into the North and West Stand for the thousands of fans expected to attend the match. At Gate C, where the external crushing began, there was only one gate and seven (A–G) turnstiles available for fans to use (Figure 9.3). By 2:30 p.m., a bottleneck had developed at the Leppings Lane end of the ground, exacerbated by local road works that had delayed some fans' journeys and resulted in more fans arriving late for admittance than would normally be the case. Eyewitness testimony states that some fans appeared to find the delay in entering the ground frustrating and were pushing from the back of the queue, thereby physically forcing other fans into the stadium. Others were so desperate to gain access prior to the start of the match that they were seen crawling on their hands and knees to try to move further up the queue.

In previous years, the police had used outer cordons in Leppings Lane, which acted as a filter to shepherd fans who did not have tickets for the match away from the ground. Such cordons were not in place on this occasion, and between 2:30–2:50 p.m., the police began to fear that fatalities may result outside the ground if the pressure in the queue on the turnstiles could not be eased. Communication between officers on the ground was difficult. Radios were issued to the rank of sergeant and above and "... with radios being set on 'talk-through' and the loud crowd noise, communication between officers was made very difficult" (Taylor, 1989, p. 8).

Superintendent Roger Marshall, who had been placed in charge of the welfare of supporters outside the ground at the Leppings Lane end of the stadium, became concerned about public safety due to the pressure from the large number of supporters who had arrived late and were still trying to gain access. South Yorkshire Police took two lines of action to relieve pressure: they attempted to close perimeter gates, and at 2:52 p.m. Marshall made a request for the Match Commander chief superintendent David Duckenfield to open the gates on Leppings Lane to relieve the pressure at the front of the queue. This request was granted.

When the gates were opened, additional fans were allowed to enter the ground. As they did they came onto a concrete concourse that terminated in an area behind the West Stand, directly behind the goal at the back of Leppings Lane terraces. Inevitably, having seen the playing area directly in front of them down a tunnel, the majority of the additional supporters headed straight for Pens 3 and 4, which were already crowded. In less than 5 minutes, 2,000 additional fans moved straight into a standing-only area, which was already packed with supporters and had a gradient of 1:6. The slope effected a mass movement forward, causing thousands to lose their footing and control of their balance and direction.



Figure 9.4 Fans escaping the crush. (Photo courtesy of Rex Features.)

At 3:06 p.m. officers were instructed to attend the Leppings Land end of the stadium to stem what was interpreted as a pitch invasion. These included officers who had been working outside the stadium, most without radios, who had become aware of some sort of problem within the ground. These officers entered the ground through Gate C at the same time and began working toward Pens 3 and 4 from behind, unaware of what was to meet them there. Initially, as police and match officials thought a mass public order offense was occurring, they tried to push fans back (who were trying to escape over the fence onto the pitch) into the pens (Figure 9.4). The fans at the front of the stand had nowhere to go and were being crushed against barriers on the terraces, ironically designed to reduce crowd surges, and the high metal fences that had been introduced to deter hooliganism. At the same moment (3:06 p.m.) match officials stopped play at the request of a police officer who ran onto the pitch. The rescue operation now began, as it was only then realized that a major incident was occurring.

Extraordinary footage exists of the event as it unfolded, as there were eight BBC cameras in the stadium televising the match live. Evidence shows that the police and match officials attempted to help those trapped, but for many it was too late. Match officials, the police, and other members of the crowd lifted bodies onto the pitch. A number of individuals were also recovered from within Pens 3 and 4 by officers who had entered from the rear of the stand. These were taken to the concrete concourse at the back of the Leppings Lane stand, where resuscitation was attempted unsuccessfully. Officers attending the ground, stated that it was not until later, when they

saw the events unfold on television and were interviewed by West Midlands Police, that they began to understand fully what had transpired.

Victim Recovery and Identification

Today, the disaster at Hillsborough Football Stadium would be classified as an *open incident* because there were no restrictions on ticket sales or movement of fans within sections of the ground once they had gained entry. A total of 96 people died as a result of the events at the stadium: 94 of these died on that day; a 14-year-old boy died 4 days later in hospital, and in March 1993 another male died after remaining in a persistent vegetative state for 4 years.

Once the extent of the incident became known, a major incident plan was activated. This plan saw the ground's gymnasium, a large sports hall, converted into an area where all victims were taken for triage. Here all individuals were assessed by a doctor and were either conveyed to hospital, treated at the scene, or pronounced dead. All individuals who were not taken to hospital remained in the gym, which had been divided into three distinct areas: (1) holding; (2) viewing and formal visual identification; and (3) statement taken from the person making the identification. Each area was separated by large curtains that naturally segmented the area. Office space was used to receive relatives and collect antemortem (AM) data.

Despite the trauma suffered due to crush injuries, no deceased suffered any major disruption. After lengthy discussion, the coroner for the City of Sheffield, Stefan Popper, made the decision to leave all of the deceased in the gymnasium situated under the North Stand to allow formal identifications to take place. Very few records were kept regarding the location from within the stadium from where the victims had been recovered; records that were kept consisted of basic diagrams.

Of the 95 victims who died on that day or within the next few days, 88 were male and 7 were female. Of these, 14 were at one of the receiving hospitals in Sheffield, and the others died either within the stadium or at the audit holding area (AHA) in the gymnasium at the ground. Those who died at or on the way to one of the hospitals were subsequently returned to the gymnasium for the identification process to continue at the direction of the coroner. Only when the identification process was completed were the bodies of the deceased removed to the Medico-Legal Centre, which was the combined Coroner's Court, city mortuary, and Department of Pathology for the Sheffield area. This modern, purpose-built facility had the capacity to store 96 cadavers (following a recent refurbishment), and the decision was made that the postmortem (PM) examinations would occur at this facility.

The individuals who died at, or who were returned to, the ground were laid out in rows in individual body bags on waterproof tarpaulins. A consecutive

numbering system was used, thereby providing a unique reference number (URN) for each victim. A photograph was taken by a police photographer of each individual's head and shoulders, which was then placed on a notice board within the foyer of the gymnasium. This method was selected to prevent the families and friends of the deceased being required to walk among the rows of dead attempting to locate their missing family member or friend. For continuity purposes, each victim had a designated officer assigned, whose role was to guard the deceased and remain with the individual until they had been visually identified and then to accompany them to the Medico-Legal Centre in Sheffield, approximately 3 miles from the stadium.

Many of the deceased were children and young adults, the common demographic of football supporters. Whole families had been at the match. As more deceased individuals were brought in to the gymnasium, distress levels rose among the survivors, many of whom were looking for missing loved ones. People were invited to view the Polaroid images in an attempt to identify the deceased. Where a potential identification was made from the photograph, individuals would inform a police officer of the number and then would be taken to the gymnasium and the deceased victim brought to the viewing area on a stretcher, where the body bag was unzipped and a formal identification made. Victims were then escorted to the Medico-Legal Centre with the accompanying officer. The person making the identification was taken to a third area where a statement was obtained relating to the identification aspect of the inquiry. This process, formally approved by the coroner, had been developed spontaneously to meet the immediate requirements. Some relatives, having found a family member, refused to be parted from them or attempted to revive them.

South Yorkshire Metropolitan Ambulance Service (SYMAS) was requested to attend the ground and transport survivors in most need of hospital treatment to the Northern General and Royal Hallamshire hospitals in Sheffield. By 4:30 p.m., approximately 172 casualties had been conveyed to the two receiving hospitals.

There had been a long-standing responsibility for specific departments at each police district to forge close relationships with local hospitals to enable relevant victim information to be collected and collated in the event of a mass fatality incident (MFI). A plan was in place for this aspect of the response, and the hospital liaison role was exercised regularly, including checks that the two methods of communication at the time (i.e., telephone and fax) worked efficiently. As a result, police personnel knew what was expected of them and had good links with the staff at the local accident and emergency (A&E) departments. Immediately after the scale of the incident was recognized, dedicated hospital liaison personnel were deployed to the receiving hospitals, where specific office space, allocated as part of the plan, had already been set aside for their use. This allowed police personnel to quickly establish an

information center at both hospitals, where they commenced speaking with the many injured and accompanying people who were already arriving at A&E sites.

However, before long, these officers were recalled to the stadium to assist other officers at the gymnasium. This left a void at both receiving sites, causing frustration for family members attempting to obtain information about their missing family members. The injured and deceased kept arriving. Records from the Northern General Hospital clearly show the strain the emergency services were under, as within the first hour postincident 88 people had been brought in; of these 11 were dead upon arrival, 56 were admitted, and 21 were treated and discharged. Both hospitals continued to receive large numbers of casualties, including deceased victims. In addition, they also dealt with persons searching for missing family or friends or grieving for the dead. This type of influx of people can detrimentally affect the working of a hospital. In one of the hospitals, the uninjured were redirected to the hospital canteen to await news. Eyewitnesses recall that the assistant hospital administrator came into the canteen and began reading out descriptions of the dead; as they did so people started collapsing with grief and shock. Later, when interviewed, the administrator broke down and cried at the mistakes that had been made and the unnecessary grief caused.

During the incident, Hammerton Road Boy's Club (Hillsborough Justice Campaign, n.d.), a disused premises, was used as the designated holding area for persons who wished to report a missing person to the police. This building was selected as it was conveniently located opposite the police station. However, it lacked facilities and was disorganized; as a result families and friends of missing individuals complained of having received incorrect information (*ibid.*).

In total, 766 people were injured at Hillsborough; 20 were injured seriously, and 96 lost their lives. PM examinations, conducted over a 48-hour period, were undertaken on the 94 victims who died at the ground under the direction of Professor Alan Usher, the lead Home Office pathologist. At the instruction of the coroner, blood samples were taken to establish the alcohol level in each body. Of the 95 individuals who died within days of the incident, all but 9 deaths occurred as a result of crush asphyxia. One victim suffered a ruptured aorta, six had injuries to the head, neck, or chest, and two died of natural causes. Of the injured, 730 were hurt inside the ground, and another 36 were injured outside the stadium, the majority of whom suffered bruising to the ribs and chest.

Time of death, as directed by the coroner, was recorded as 3:15 p.m., as he was satisfied that, having read medical reports, all of the deceased would have been brain dead by this time. He therefore ruled out any evidence relating to events that occurred after this time. This caused concern for some families, as they believed their loved one was still alive at the prescribed cutoff time.

That all 94 individuals who died that day were examined in such a short period of time is exceptional, particularly as “special” PMs (those performed with additional forensic requirements) take anywhere between 1–2 hours depending on the condition of the remains. In this case, limited PMs were carried out based on an examination strategy agreed between the attending pathologist and the coroner. Popper also made the decision that the method of confirmation of identity would be a combination of a visual one, made on the part of the families and friends, and personal property found on the body. This decision was taken with the best interests of the bereaved at heart: Although it was possible to obtain the victims’ fingerprints, it was considered that the time it would have taken to obtain comparative AM sets would have caused delay and additional stress to the bereaved. Obtaining dental records would have been a similarly time-consuming process. It must be recognized, however, that although additional time would have been taken to obtain reliable AM information of primary identification characteristics* for the available matching methods, this would have had two significant benefits. First, the identifications would have been reliable and would meet today’s standards, and, second, the bereaved families would not have had to view photographs of 94 deceased individuals. Today, the coroner in association with the senior identification manager (SIM) would determine which primary identification criteria may be accepted in the incident. Visual identification would never be considered a primary factor.

At the inquest, the coroner delivered verdicts of accidental deaths. Following confirmation of identity at the identity commission, Popper did not delay in releasing the bodies back to the families.

After the Event

The Right Honorable Lord Justice Peter Taylor was appointed to conduct a judicial inquiry into the disaster, with assistance from West Midlands Police. The hearing opened on May 15, 1989, and lasted 31 days. During the investigation 3,776 statements were obtained, 1,550 letters were received, and 2,666 telephone calls were taken. Taylor prepared two reports, the first of which was an interim report detailing the immediate conclusions of the events on the day of the incident. The initial report, published on August 4, 1989, concluded that Sheffield Wednesday Football Club and Sheffield City Council were responsible for failures with regard to safety issues. It is clear from Taylor’s (1990) report and from eyewitness testimony that a number of factors combined to result in the fatalities at Hillsborough. However, blame

* Today, primary sources are composed of four identifiers: DNA, fingerprints, odontology, and unique medical condition (UMC).

was particularly focused on senior officers from South Yorkshire Police, specifically the overall match commander, Duckenfield, and his deputy, Superintendent, Bernard Murray. The report stated that the main cause of the disaster was failure of police control. He described the failure to cut off additional access for fans to Pens 3 and 4 as “a blunder of the first magnitude” (Taylor, 1989, p. 40), adding that Duckenfield, the officer in charge, “froze” (*ibid.*, p. 50).

On August 30, 1990, the director of public prosecution (DPP), Alan Green, concluded that there was insufficient evidence upon which a prosecution could be brought for any criminal offense. The wording of the DPP’s decision followed a standard format and did not specify the reasons leading to his decision. On July 11, 1991, the Police Complaints Authority (PCA) directed that Duckenfield should face disciplinary procedures, and Murray should face one disciplinary charge. Duckenfield was on sick leave. On hearing independent medical advice that Duckenfield was too ill to undergo the disciplinary process, the chief constable consented to a request to allow Duckenfield to retire November 10, 1991. On January 13, 1992, the PCA allowed the disciplinary action against Murray to be terminated because it held that it would have been unjust to pursue a joint charge against him alone in the absence of the more senior officer. As a result, on April 6, 1993, relatives of six of the victims were granted an application for a judicial review of the inquest verdicts. On November 5, 1993, the Divisional Court concluded that the coroner’s procedure and the jury verdict were correct (Stuart-Smith, 1998; South Yorkshire Police, 2005; Taylor, 1989).

In June 2000, both Duckenfield and Murray faced charges of manslaughter (and others) at Leeds Crown Court. The case against them had been brought as a private prosecution by the Hillsborough Family Support Group and was heard before a jury. The trial judge was Justice Hooper. The six-week trial ended with a not-guilty verdict for Murray; members of the jury were unable to agree on a verdict for Duckenfield. The judge ruled that the case was over and that there would be no retrial (South Yorkshire Police, 2005).

However, there are a number of areas where issues were addressed and people performed well. An example of where suitable preparation for such an event had been carried out was the general staffing level for the day and that all officers had received a briefing hours before kick-off. At that briefing, Duckenfield stated that kick-off would be delayed only in exceptional circumstances. It could be argued that adherence to this position may well have contributed to his decision making later in the day.

Another example of well-executed action was the use of the gymnasium. Although using the gymnasium caused some problems, as dual use would inevitably add to the stress of an already horrific situation, from the plans of the stadium’s grounds this was the only choice as a temporary body-holding area. The gymnasium was approximately 150 feet long by 100 feet

wide, making it the only enclosed building suitable to accommodate the large number of victims in this incident. Therefore, the authorities had little choice; placing casualties among the dead and having friends and relations present must have exacerbated this situation. However, similarly aggravating would have been refusal of so many to view their deceased, which could well have led to a public order situation, thereby putting additional pressure on an already stretched police force.

Initially, there were complaints from families that they had not been able to determine precisely when and where their family members and friends had died. It must be remembered that from this disaster there emerged 71 hours of video footage, sourced from the police, the football club, and the BBC. In addition, there were 600 color still photographs taken by the police for normal intelligence-gathering purposes and a further 1,800 press photographs. Initially, the police were reluctant to involve families in the identification process due to the distressing nature of the photographs. Following consultation with social services and the families, the police altered their decision, and 80 families who wished to view the evidence were allowed to take part in the identification process. At the inquest, it was revealed that there had been a considerable amount of misidentification from the images regarding those who had died; however, it is natural for family members and friends to want to know the circumstances of their loved one's death. The cause of death can of course be determined by PM, but this does not help put the death in context for families. To refuse them the right to view the intelligence gathered may have fueled more questions that could not be answered and would be entirely inappropriate today due to the fundamental principles of honesty and transparency within the process of victim identification.

The actions of police officers on the day should also be acknowledged, as they worked tirelessly. In addition, as the comments by Lord Justice Taylor demonstrate, the public at the ground that day responded magnificently. Medically trained staff came forward to offer their services, and fans, some of whom had been injured themselves, became involved in assisting the movement of other injured persons. Hoardings were used as stretchers to carry the victims, and in the majority of cases people worked well together to assist those who had been injured.

The enactment of a major disaster plan, when implemented following a request for operational support to be commenced, this action began to bring order to events. The coordination between emergency services became evident and the gymnasium being taken into use as an audit holding area worked well under the circumstances. Following all victims being recovered and given that the victims were not disrupted, the PMs were conducted over a 48-hour period by a team of pathologists, headed by Professor Usher. It is quite remarkable that 94 victims were examined in such a short period of time, particularly since deaths due to accidents are treated as crimes. The

PMs were undertaken with evidence collection in mind because although it may be the case that the event was accidental it does not mean that there will be no liability. Typically, a special PM examination may take anywhere up to 2 hours to ensure all relevant samples are collected. Following the disaster, PM examinations were focused on the obvious areas of the body likely to be injured as a result of what had taken place. The use of the specialist mortuary, located in a busy city center, was a bold decision at the time and allowed all 94 victims to be processed in only 48 hours, but it also led to problems. Its use created a massive burden for the scenes of crime officers (SOCOs) who were required to attend the examinations and recover and record relevant exhibits. As a result of the work involved, a team of SOCOs was required as opposed to the usual one per victim. In addition, using the Medico-Legal Centre as a temporary mortuary also rendered the “normal” facility for South Yorkshire unavailable in the event of serious crime. It could be argued that taken together the mistakes may have created significant risk in respect to the hours worked by all staff over a short period of time.

Today, disaster victim identification (DVI) has certainly progressed as a science. The officers involved in the incident at Hillsborough stadium worked valiantly under extremely stressful circumstances to achieve the best result they could. Each mass fatality event has been a learning curve, and a number of factors and issues would have been addressed differently had the incident occurred today. For example, as soon as the size of the incident had been recognized by the authorities, the need for a DVI response would be recognized and a course of action undertaken, including a process under which the local coroner would have been informed and DVI teams would have been put on standby while the extent of the disaster was determined. In the event of a significant incident, each force now has a number of officers trained in mass fatality victim recovery who would be contacted as part of the DVI deployment (as would out-of-force DVI-trained individuals).

As previously mentioned, poor communication was certainly an exacerbating factor in the Hillsborough disaster, as many of the officers on the ground had no way of communicating with each other (only those officers at the rank of sergeant and above were supplied with radios; Taylor, 1989). In addition, although a number of different frequencies were available for use on both ultra high frequency (UHF) and very high frequency (VHF), radios were set at “talk-through,” meaning that all radio communications could be heard by all those with a radio. This ensured that all those with radios were aware of what colleagues were saying but also meant that there was a considerable amount of overtalking and background noise during transmissions. Added to this the initial lack of coordination and communication among the emergency services was compounded by the fact that SYMAS was not represented at the match prior to the disaster occurring.

Other problems occurred with communication; for example, it took over 1 minute to get a message to the fire service that cutting equipment was required to assist in the removal of victims from the stands. When the first appliance arrived at the scene, the reaction of the police officers to whom they reported was to query why they were there. Certainly these issues led to delay in helping the victims. In addition, at that time there were no computer programs such as Plass Data available to assist with the matching of AM and PM data files.

Today, communication has made significant advances; all police officers now have access to personal issue airwave radio sets, and in addition most carry mobile telephones. Police support units (PSUs) work in teams at large sporting events; these teams are extensively trained and mobile, which allows the ability to deploy in multiples of six officers. These units provide a flexible response capability and would be able to assist quickly in crowd evacuation or victim recovery. As part of a victim recovery and identification team (VRIT), specialist officers are trained in evidential recording and recovery, facilitating full victim and property recovery while ensuring that an audit trail is established.

If the Hillsborough or a similar disaster happened today, the SIM would allocate a mortuary manager who would be trained to organize staff and allocate team members into groups to effectively deal with victims and their effects and would introduce “clean” (or “dry,” or not contaminated) and “dirty” (or “wet,” or biologically contaminated) zones and would use risk assessments for officers working in that area. Appropriate personal protective equipment (PPE) would be made available to all staff working in the dirty areas.

Original plans involved the use of two temporary mortuary facilities—one in Doncaster and one in Sheffield—which would have used Ministry of Defence (MOD) properties. Previously it was felt that reliance on MOD properties may not be appropriate in that it may present a potential conflict of uses, should the military require the locations for deployment of its own resources in the event of a mass fatality disaster with a political threat.

As a result, and in conjunction with the requirements of the Human Tissue Authority, South Yorkshire now has plans in place for the deployment of two temporary mortuaries based in Sheffield:

- A private company manages the National Emergency Mortuary Arrangements (NEMA) under a contract with the Home Office and supports the deployment of a temporary mortuary. The company has responsibility to deliver, construct, and equip a 600-casualty temporary mortuary anywhere in the United Kingdom within 72 hours. This capability includes the setup of key components within 48 hours.

- There are plans for the use of the Medico-Legal Centre in Sheffield (and its adjoining land) to be used as a temporary mortuary with other mortuaries in the county taking Sheffield's casework in the event of a "smaller" mass fatality incident.

In the case of the Hillsborough disaster, the use of a temporary mortuary site other than the Medico-Legal Centre would have left the center free to deal with PMs following serious crimes. In addition, use of a temporary site would have reduced the need for staff to work such long periods on duty. As a result of establishing the temporary mortuary, a SIM would be appointed to coordinate all identification issues. In addition, a visual and cursory identity check would be performed, such as checking to see if individuals had any photographic identification on them. Importantly, a URN would be assigned to the deceased before being moved to the temporary mortuary. It should be noted, however, that even if photographic identification had been found and appeared to match the deceased, this would remain a presumptive identification until it could be corroborated by one of the four primary identification factors: DNA, fingerprints, odontology, or unique medical condition.

The use of photography is known to be fraught with problems when using PM images to identify the deceased. Misidentification occurs for a number of reasons, and it is widely accepted that the deceased do not resemble their living form. Consequently, photographs would never be used by DVI-trained teams to help identify the deceased, although photography does have a place in the DVI process (e.g., to visually record areas and items of interest) but never as a primary identifier.

The use of a disused building for the holding area for families, although in some ways convenient, would not be considered viable today as it did not have the requisite facilities in place to deal with large numbers of people. By contrast, a casualty bureau would be quickly activated as a starting point for data collection from the public. A call system would be put in place, with the primary aim being to assist the police in compiling a list of people most likely to have been involved in the incident ("Grade 1" missing persons, or "mispers"). As the disaster was regarded as an open incident, questions would be developed and used as a filtering and assessment process to identify those most likely to be true casualties. It should be noted, however, that an additional complication for the police to deal with during the Hillsborough incident was that whole groups of families and friends were attending the match together, and some of those attending the match elected to occupy positions in the stands away from other members of their family. This meant that individuals who would normally be telephoning the casualty bureau were already in the immediate vicinity and may well have already been aware that a loved one was involved and possibly even deceased. In most DVI situations, the police have a time frame before the majority of friends and relations begin

to physically arrive at the incident site, thereby providing the police valuable time to enact measures such as the casualty inquiry bureau.

In addition to collecting and collating information from the public, trained officers would now attend at the receiving hospitals to collect further information and obviously reduce the list of possible decedents. Once a list of Grade 1 missing persons had been developed, a family liaison officer (FLO) would be allocated to the family of each known decedent, to act as a single point of contact between the family and the police. Had this been the case at Hillsborough, it would have prevented criticisms that were made of the police at the hospital during the incident. One relative claimed that she was refused the right to see her daughter, as her daughter's remains were now the property of the coroner. The allocation of an FLO to work with the family would prevent such a breakdown in communication or misinformation as, although a body is in the possession of the coroner, it is never described as being property. Use of an FLO would also facilitate the collection of accurate AM information, collected on yellow (AM) Interpol forms to be compared with pink (PM) Interpol forms. Today, FLOs would never advise a family as to whether to view a loved one; instead, they would give information regarding the condition of the body and explain the process of viewing, thereby enabling the family to make an informed decision. After Hillsborough, families were distressed about being allowed to view the deceased only from behind a glass screen. After a disaster, regardless of the condition of the body, family members may wish to be with their loved ones, and this is now recognized as a right that is crucial for the future psychological well-being of those who have suffered a loss.

In the Hillsborough disaster, reassurance was given to injured parties suffering from the psychological symptoms of distress who had attended hospitals only immediately after the incident, and these were given a helpline number for emergency social services. As time elapsed postincident, the number of patients exhibiting psychological problems increased, causing an increase in the number of psychiatric referrals from general practitioners and social services for treatment for posttraumatic stress. This exemplifies the importance of suitable support at the time of the incident and the importance of the role for the FLO. Today, in most towns and cities an emergency plan has been developed to include a psychological response to a disaster, such as the rapid establishment of a telephone helpline to be widely advertised though the media on television, radio, and on line. In addition, an advice leaflet would be distributed outlining the symptoms of trauma and how professional help can be sought.

Due to the intense stress under which the emergency services worked and lack of training in readiness to deal with this situation, a number of police officers also suffered psychological episodes after the Hillsborough incident. For example, post-Hillsborough, psychiatric injury to three police officers led

to the end of their careers. Commonly known as occupational stress, these officers were ill-equipped to deal with the situation in which they found themselves. This situation is unlikely to occur today as it has been recognized that, because of incidents such as Hillsborough, emergency responders may require postincident support, which must be conducted by trained mental health staff to allow those at risk of posttraumatic stress disorder (PTSD) to be identified and treated. In addition, DVI supervisors at the scene are now much more aware of the symptoms and observe their team's reactions under severe pressure, with a view to minimizing the risks by identifying signs of stress at an early stage. It should be noted that for the first time in South Yorkshire officers attending the Hillsborough disaster were offered "trauma counseling" following completion of their tour of duty. This had not been carried out before and contributed to the development of counseling work undertaken by occupational health units today.

Conclusion

With the benefit of hindsight, following any major disaster it is easy to say what should or could have been done differently. However, as this incident unfolded in 1989, mistakes were made at the time, the consequences of which could not have been foreseen or prevented. The answer is not to assign culpability but to learn lessons. Officially, the report by Lord Justice Taylor blames the police for the disaster, but two officers were tried and acquitted of manslaughter. The Taylor Report also made specific recommendations for sporting facilities, such as the suggestion of all-seated stadiums, the removal of perimeter fencing from football grounds, and the presence and availability of sufficient ambulance and medical staff at such events. The tragic events at Hillsborough continue to impact many people to this day, but the cornerstone of the current principles of DVI and practices of victim recovery and identification teams may be traced back to the events at Hillsborough in 1989.

The main lessons learned from the Hillsborough incident relate to methods of body recovery, identification, and sensitivity. The incident also highlights the importance of providing suitable psychological support, not just for the families and friends of those involved but also for the emergency responders. Through postincident occurrences, it has been shown that failure to take account of the effects of trauma on both the victims' families and friends in addition to the emergency service workers can lead to longterm damage. The introduction of supporting roles such as DVI teams and FLOs and an increase in effective training for all members of staff are helping to mitigate these problems. This incident serves as a reminder that the dangers of this type of work, both at the time and postincident, should never be underestimated and are

as important to consider in the planning stage as all other aspects of disaster victim identification and mass fatality incident management.

At the time of the disaster, South Yorkshire Police did not have the capability to mount a recovery program for a mass fatality incident. It has been acknowledged that the disaster at Hillsborough stadium was a catalyst for many changes and prompted South Yorkshire Police to look at the requirement for a specialist team. The circumstances and subsequent inquiries led to the introduction of mandatory first aid training and in the early 1990s training commenced in specialist disaster management, using staff from across the force and training in specific skills such as management, leadership, and supervision.

Since the disaster, memorials have been built and dedicated to the memory of those who died, and their families are still fighting for justice for their loved ones who were lost to them that day. Memorial services are held annually and to commemorate significant dates in relation to the disaster, such as the tenth and twentieth anniversaries. Such was the enormity of the tragedy that the Hillsborough disaster will remain alive in the memories of all those caught up in the events of that fateful day in April 1989.

References

- Hillsborough Justice Campaign. (n.d.). The Hillsborough Football Disaster. Available from <http://www.contrast.org/hillsborough/history/hospitals.shtm> (accessed February 15, 2010).
- South Yorkshire Police (2005). The Hillsborough Stadium Disaster: 15th April 1989. A Brief Summary. The Freedom of Information Unit, South Yorkshire Police. Available from http://www.southyorks.police.uk/sites/default/files/foi/significantpublicinterest/hillsborough_summary.pdf (accessed November 19, 2009).
- Stuart-Smith, R. H. L. J. (1998). Scrutiny of the Evidence Relating to the Hillsborough Football Stadium Disaster. Available from <http://www.southyorks.police.uk/sites/default/files/foi/significantpublicinterest/scrutiny%20of%20evidence%20hillsborough%20disaster.pdf> (accessed November 19, 2009).
- Taylor, P. (1989). Interim Report—The Hillsborough Stadium Disaster: 15th April 1989. Inquiry by the Rt Hon Lord Justice Taylor. Available from: <http://www.fsf.org.uk/uploaded/publications/pdfs/interim%20report%20hillsborough.pdf> (accessed November 19, 2009).
- Taylor, P. (1990). Final Report—The Hillsborough Stadium Disaster: 15th April 1989. Inquiry by the Rt Hon Lord Justice Taylor. Available from <http://www.fsf.org.uk/uploaded/publications/pdfs/hillsborough%20stadium%20disaster%20final%20report.pdf> (accessed November 19, 2009).

The *Marchioness* Riverboat Disaster, August 20, 1989

10

GRAHAM WALKER
XANTHÉ MALLETT

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Introduction

This chapter focuses on the disaster victim identification (DVI) processes undertaken following the sinking of the *Marchioness* passenger vessel, which collided with the dredger *Bowbelle* on the River Thames, on August 20, 1989. A total of 51 people died as a result of this incident. The responding force was the Metropolitan Police Service (MPS), the largest police force in the United Kingdom with excess of 25,000 officers at the time of the accident (Figure 10.1). This incident is of additional significance in terms of legislation due to the subsequent public inquiry undertaken by Lord Justice Kenneth Clarke (2001) and his influential recommendations.

Circumstances

At 1:46 a.m. on August 20, 1989, the *Marchioness* pleasure boat collided with the dredger *Bowbelle* in the vicinity of Southwark Bridge on the River Thames in London, essentially focusing the accident and response area on the stretch of the upper Thames between Nine Elms and Cannon Street Bridge. This placed the incident between the City of London (with its own police force) and the London Borough of Southwark.

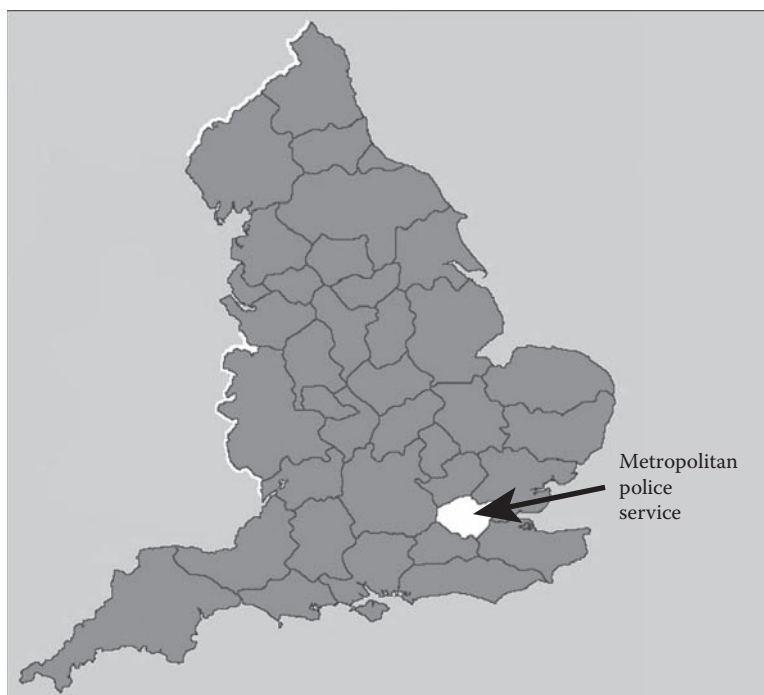


Figure 10.1 Policing regions of England with Metropolitan Police Service boundaries highlighted.

The *Marchioness* was an 85-meter, 46-ton passenger launch. At the time of the incident she was crewed by just two individuals and two bar staff, with around 132 guests in attendance for a party celebrating the twenty-sixth birthday of Antonio de Vasconcellos. The other vessel involved in the collision was the *Bowbelle*, an 800-meter long, 2,000-ton dredger, manned by a crew of nine hands and captained by Douglas Henderson. Fifty-one individuals lost their lives, all of whom were aboard the *Marchioness*, and many of them trapped in the vessel as she sank (Clarke, 2001). No one aboard the *Bowbelle* was injured.

There were two impacts between the vessels. The first contact occurred between the starboard bow of the *Bowbelle* and the port quarter of the *Marchioness*, significantly adjusting the heading of the *Marchioness* to port (Figures 10.2 and 10.3). Following this, the *Bowbelle* continued to overtake the pleasure vessel, with her bow leaning against the *Marchioness*, pushing her stern away. At the same time, the starboard anchor of the dredger cut through the port side of the upper deck superstructure of the *Marchioness*. Approximately 4 seconds after the initial contact, the two boats collided a second time, with the *Marchioness* swinging to port and the *Bowbelle* again making heavy contact with the port quarter of the *Marchioness*. This second

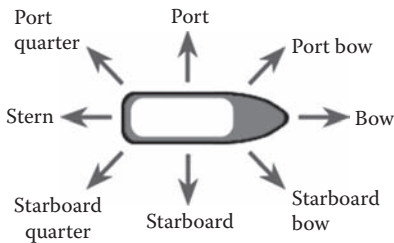


Figure 10.2 Boat orientation.

impact occurred about 10 meters from the stern, with the *Marchioness* advancing around 3 meters between impacts. The second contact was particularly damaging to the passenger vessel, and she began flooding as she swung around the bow of the dredger and passed down her port side; in effect the *Bowbelle* mounted the lighter boat so that the momentum of the much larger vessel pushed the *Marchioness* beneath the water (Clarke, 2001). It took less than 30 seconds from the point of initial collision to total submersion of the *Marchioness*—offering little chance of escape for those trapped below deck of the passenger vessel. There had been no visual contact, and therefore there was no opportunity for evasive action (*ibid.*).

The incident was reported by VHF (very high frequency) radio to the Wapping Police Station by another passenger vessel, the *Hurlingham*, whose crew and passengers witnessed the accident from a distance of approximately 45–60 meters. The radio message sent by the *Hurlingham* was overheard by the Thames Navigation Service at Woolwich, and four high-speed police patrol boats from the Thames Division were on the scene within 6 minutes (MPS, n.d.-b), dispatched from Waterloo and Wapping.

At the time of the incident, the weather was fine and clear, and it was a warm August night. There was little wind, with a tide flow of approximately 3 knots in the period before the collision (Clarke, 2001). The weather was important in this case; due to the evening being warm, a considerable

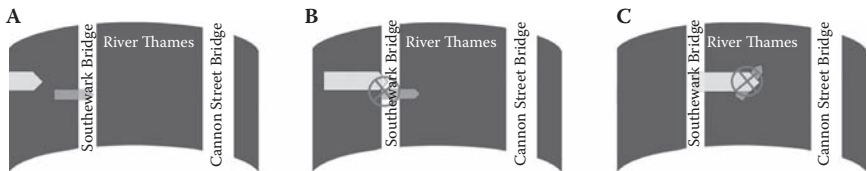


Figure 10.3 Illustration of the moments immediately prior to and after the collision. Yellow boat = *Bowbelle*. Green boat = *Marchioness*. A: Relative positions of the two vessels on the river, moments before the first contact. B: Contact 1, vessels collide under Southwark Bridge (red cross). C: Contact 2, the *Bowbelle* makes heavy contact with the port quarter of the *Marchioness* (red cross), mounting and sinking the lighter passenger vessel.

number of passengers aboard the *Marchioness* were above deck, which was significant in terms of survivability. Of the 80 survivors, more than half were rescued from the river by the police launches, while the remainder were rescued by the *Hurlingham*, both directly from the water in the region of the incident and further downstream. Others managed to get ashore. No survivors were rescued by the *Bowbelle*, and during the course of the investigation into the causes of the disaster Henderson was arrested. He was prosecuted twice as a result of the incident, and on both occasions the jury failed to reach a unanimous verdict. Paul Knapman, the coroner for Westminster, opened and adjourned the inquests pending criminal proceedings that may have followed. A number of families attempted unsuccessfully to bring a private prosecution for corporate manslaughter against the owners of the vessels (Irwin Mitchell, n.d.).

Victim Recovery and Identification

This was an open incident in that there was no definitive passenger list available for the *Marchioness* at the time of the accident. In total, 51 of the 132 passengers (approximately 39%) and four crew aboard the *Marchioness* died, although the precise number of passengers and fatalities could not be established immediately. The first body was recovered from the water in the early hours of August 20 and was given the unique reference number (URN) 2600. A further 26 bodies were later recovered from the Thames on or after August 22, all of which were given the prefix 26 and thereafter numbered sequentially from 2601–2626. A total of 24 bodies were recovered from the wreck of the *Marchioness* during the afternoon of August 20 after the salvage operation was completed. For identification purposes (Figure 10.4) these victims were given the prefix 29, thereby distinguishing them from the victims found in the river, and the URNs ranged from 2900–2923.

The MPS response consisted of the enactment of the Metropolitan Police Major Incident Procedure (LESLP, n.d.-b) by the Thames Division, and a rendezvous point (RVP) for all first responders was set up near to the Waterloo Pier Police Station. This was also the designated landing place for casualties. In addition, an incident room was established at New Scotland Yard to house the officers involved with the incident. Their role was to collate and process antemortem (AM) information (e.g., basic physical descriptions, clothing worn), which was received on an hourly basis from worried or concerned members of the public. The response was rapidly escalated, with a major incident being declared at 2:12 a.m. on August 20; the casualty bureau opened at 3:20 a.m. Before 6:00 a.m. members of the Heathrow body recovery team were deployed to attend Wapping Police Station, with the first victim's body arriving at 6:50 a.m. (*Marchioness-Bowbelle.org*, 2000).



Figure 10.4 Wreckage of the *Marchioness* pleasure boat. (Photo courtesy of Clive Dixon/Rex Features.)

No temporary mortuary was used in this incident; instead the bodies were initially transferred to Wapping Police Station, which was treated as a body-holding area. To ensure continuity, each body was accompanied by at least one police officer from the point of recovery. From there, bodies were taken to Westminster mortuary for the initiation of the identification process. For victims 2600 (first deceased victim recovered from the water) and 2900–2923 (the 24 victims recovered from the wreck itself), visual identification was considered acceptable as they had not been in the water for a prolonged period. All 25 of these individuals were consequently visually identified at Westminster mortuary by family or close friends between August 21 and 23, 1989.

The only guidance available with regards to recovery of the deceased at the time of the incident was available from the London Emergency Services Liaison Panel (LESLP, n.d.-a). This had been established in 1973 to coordinate the emergency services' response to major incidents. The LESLP consisted of representatives from the emergency planning departments of the MPS, the City of London Police, the London Fire Brigade (LFB, n.d.), the London Ambulance Service (LAS, n.d.), and the London Fire and Civil Defence Authority (Clarke, 2001). The LESLP major incident manual (LESLP, n.d.-b) in force at the time of the accident provided that the "major incident procedure" was to be adopted whenever it was considered necessary for any of the emergency services to undertake a large-scale deployment to a specified incident. This procedure stated that there should be close liaison between

the emergency services during response to such incidents, with the police acting as “lead” responder to coordinate the work of the first responders and deal efficiently with the incident as a whole. There was no specific emergency plan in place to deal with a major disaster on the River Thames. In addition, the LESLP advice did not include instructions to initiate the gold, silver, and bronze protocols,* although the officer in charge of the search and recovery stage on the night of the incident, Commander Anthony Speed, did initiate this command structure within the framework laid down by the LESLP procedures (Clarke, 2001).

A team of 15 relative liaison officers (now referred to as family liaison officers [FLOs]) was established. These officers were responsible for collecting all AM details from the families of the Grade 1 missing persons (i.e., individuals considered most likely to be involved), which originated from the work of the casualty bureau and then led to data harvesting, and this information was then forwarded to New Scotland Yard. In common with disasters of this magnitude, the police received thousands of calls, which required collating to direct the AM data collection. By August 21, 63 suspected missing persons had been reduced to 51 through thorough and stringent AM and postmortem (PM) data matching. This enabled the police to make preliminary identifications (Marchioness-Bowbelle.org, 2000).

During the AM data collection phase, search and recovery also took place at the incident site, which in turn helped with the identification process. It would appear that upon recovery from the river the immediate priority was the prompt identification of the body and release back to the family. The officers were under pressure, as the hot weather was accelerating the decomposition of the bodies, particularly those that had been recovered after a number of days in the water.

Detective Chief Superintendent Michael Purchase was placed in overall charge of the investigation and, although no policy log for DCS Purchase is available, he made decisions in relation to the identification of the deceased in conjunction with Knapman and the Home Office pathologist, Dr. Richard Shepherd. One of the issues later raised was in relation to the victim identification process. This would specifically have been the jurisdiction of the coroner, as in cases such as this it is their responsibility to determine the accepted methods of confirming a positive identification. In this incident the coroner determined that positive confirmation of identity would be divided into two categories based on the acceptability of visual identification. First, visual identification was acceptable for the victims recovered from the *Marchioness* and body 2600, which was recovered from the Thames before the raising of the wreck, as a result of which he was of the opinion that decomposition would

* Gold, strategic command; silver, tactical command; bronze, operational command.

not be extensive. And second, as the remaining victims with prefix 26 had been submerged in water for a prolonged period, Knapman requested that visual identification not be used since the bodies had potentially increased levels of putrefaction. Consequently, the following methods were applied for those victims with prefix 29 (Clarke, 2001):

- Fingerprint comparisons with AM data
- Forensic odontological AM and PM matching
- Clothing or jewelry
- Physical characteristics

All victims were the subject of full autopsy to establish the cause of death. This process was conducted in two phases. The first was to identify and document victims' general features, their clothing and jewelry, and all other property found on them as well as any preexisting marks or scars. The second phase was the thorough internal and external forensic examination, including identifying and documenting injuries sustained during or postincident, and individuating features as well as noting any signs of natural disease.

As part of the identification procedure, the coroner for Westminster gave his permission to the senior police officer to remove the victims' hands "where that was necessary by the fingerprint officers" (Clarke, 2001, p. 23), a statement Knapman accepted having made when he gave written and oral evidence to the official inquiry into the incident. This later became a central criticism of the DVI procedure. It should be noted, however, that although Knapman accepts that the effect of his comment to the senior police officer on August 20 was to authorize removal of the hands where necessary, at the time of the meeting at which Knapman set what he would consider acceptable standards of identification, no bodies had been removed from the river. Consequently, no deceased victims had been presented that were extensively decomposed as a result of prolonged submersion in water; therefore, the time had not yet come for any final decision to be taken to remove the hands in any individual case. Permission from the coroner was required before any hands could lawfully be removed, because common law states that the coroner has a right to possession of the body* (*ibid.*). A crucial error was made at this stage in that the decision was never recorded in any policy document and no one individual was noted as having taken responsibility for this policy decision. Significantly, although the hands were removed from 25 of the 51 victims, the majority of victims were identified using other methods and not via the fingerprints taken from the severed hands.

* R v. Bristol Coroner ex parte Kerr [1974] QB 652 at 658-9.

All of the identifications were completed before September 4, and on September 5 Knapman opened the inquests into the deaths of the *Marchioness* victims (Marchioness-Bowbelle.org, 2000). It took less than 3 weeks to identify all of the deceased. The 51 victims were identified by various methods:

- Visual identification: 25 (those recovered from the wreck of the *Marchioness* when she was recovered plus victim 2600)
- Forensic odontology coupled with secondary identification criteria, including clothing or jewelry (from individuals all recovered from the river, with prefix 29): 19
- Fingerprints: 4
- Distinctive clothing or jewelry: 2
- Distinctive operative scar: 1

As soon as the identification procedure was complete and the coroner was satisfied with the identification procedure, the bodies were released to families for burial. Some elements of the release process have led to criticism, including the details provided for the registration of the date and time of death. For example, the inquiry heard that the entry in the register of Births, Marriages, and Deaths did not give the actual date and place of death but rather the date and place that life was pronounced extinct. This caused some families additional distress, as they wanted the details recorded as accurately as possible. The coroner agreed that the details entered onto the death certificate should be as precise as possible (Clarke, 2001).

A significant criticism leveled at the authorities was that some families were not permitted to view their loved one, despite persistent requests. One reason given was the condition of the bodies was reported to render the deceased visually unrecognizable, as a result it was thought that allowing the families to view their loved ones would cause more distress during what was already a very traumatic time. Some caskets were subsequently returned to the families with the lids screwed shut, causing the families to query as to why this may be necessary and in some cases leading to debate as to the certainty of the identification.

After the Event: Public Inquiry

A formal inquiry (FI) into the events surrounding the sinking of the *Marchioness* was not opened immediately, as successive governments considered a public inquiry unnecessary in light of the technical inquiries, the criminal proceedings, and the inquests (UK Resilience, 2008). The victims' families brought considerable pressure to bear; consequently, on February

14, 2000, 11 years after the event, secretary of state for the Environment, Transport, and the Regions Chris Patten MP, and Deputy Prime Minister Rt. Hon. John Prescott MP, ordered a formal investigation under section 268 of the Merchant Shipping Act (1995) (UK Government, 1995) into the collision and search and rescue (SAR) operation that followed. The formal investigation was not an inquiry into previous investigations or prosecutions but into the causes of the collision, and loss of life and the SAR operation (Clarke, 2001). Lord Justice Clarke was appointed to act as wreck commissioner to the investigation, and Commodore David Squire and Captain Trevor Bailey were appointed to act as assessors (*ibid.*). As the inquests had already concluded, an adjournment under section 17A of the Coroners Act (1988) (UK Government, 1988) did not apply (Marchioness-Bowbelle.org, N.D.).

The reasons no formal investigation was ordered before 2000 were reviewed extensively in the final report of the Thames Safety Inquiry (TSI) (Clarke, 2001), presented to Parliament in January 2000, and on February 19 Lord Justice Clarke attempted to detail the history of events since August 1989. The inquiry had terms of reference in accordance with the Merchant Shipping (Formal Investigation) Rules (1985), and in total, 72 witnesses gave evidence at the hearing (UK Resilience, 2008). This inquiry was divided into two sections:

Part 1: Addressed the identification of the victims. It also included a review of identification procedures adopted at that time in similar incidents.

Part 2: Focused on minimizing distress caused to victims' families. The aim was to advise on any additional procedures that should be followed in the future, if and when the need to identify victims arose following a similar incident. It also considered and advised on procedures for the notification and involvement of the next of kin in cases where it is necessary to establish the identity of victims.

The Marine Accident Investigation Branch (MAIB, n.d.) found the cause of the accident to have been failure of the lookout on the part of both vessels, as required by Rule 5 of the International Regulations for Preventing Collisions at Sea (International Maritime Organization, 1972), which requires that "every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision."

What is clear from the results of the inquiry is that neither vessel saw the other in time to take evasive action (Clarke, 2001). The jury returned a verdict of unlawful killing. It was suggested by Lord Justice Clarke (*ibid.*), in the official investigation documents, that there were a number of possible reasons

Henderson did not see the *Marchioness*, including intoxication or fatigue. The investigation group felt, however, that the layout of the river afforded him very limited opportunity to see a vessel ahead of him once Henderson came round to starboard after passing the bridges at Blackfriars. Lord Justice Clarke stated that Henderson should have been aware that this was the case and should therefore have been watching for other river users (*ibid.*).

Points of Merit

The inquiry determined that the SAR operation was conducted with great skill and courage by all involved. In addition, the police were commended by both the *Marchioness* Action Group (MAG) and *Marchioness* Contact Group (MCG) for the way they conducted the SAR operation and their tirelessness and selflessness throughout. In addition, the inquiry drew particular attention to the assistance of the passengers and crew of the *Hurlingham*, who put themselves at risk in an attempt to aid the survivors and to pull them out of the water. Andrew McGowan, the mate on the *Marchioness*, was also commended for his work after the collision in terms of returning to the sinking vehicle to help rescue survivors (Clarke, 2001).

Areas for Improvement

The inquiry into the incident levied criticism at Henderson of the *Bowbelle* for failing to broadcast, “Mayday,” for not deploying lifebuoys to victims stranded in the water, and for not sounding the general alarm on his vessel, which would have alerted other crew members to the incident. In addition, even though individual police officers from Thames Division Police at Wapping did an exceptional job immediately postincident, the inquiry also directed criticism at the police. The MPS (n.d.-b) were described as ill-prepared for the disaster, as there were no contingency plans in place for an incident occurring on the River Thames. Clarke did recognize, however, that the MPS did not have a responsibility for SAR on the river at that time or since.

Results of the Nonstatutory Public Inquiry

The second report, the nonstatutory public inquiry into the identification of the victims, consisted of 163 pages and 36 recommendations and suggestions for improvement to numerous agencies’ procedures. The inquiry, which reported in March 2001, made 30 recommendations about inland waterway safety (UK Resilience, 2008). Specifically, the report made recommendations for the police, coroners, and local authorities to improve methods of identification for victims of mass fatality events. The main issues raised were as follows:

- No one individual had overall control of the identification process from recovery, through the mortuary procedure, oversight of the casualty bureau, and family liaison management.
- There was a lack of overall coordination of the identification procedures.
- There was a refusal to allow relatives to view the victims.
- There was an issue of inaccurate death certificates, which showed an incorrect time and place of death.
- There was a lack of detailed information available to families.

The following failures were identified in relation to the removal of the victims' hands:

- The removal of the hands for identification purposes at a time when a positive identification was likely to have been made in the near future using other noninvasive methods, such as odontological matching.
- The failure of anyone in authority to inform the relatives that the hands had been removed.
- In some cases, the return of the body without the hands to families.
- The failure thereafter to return the hands to the body.
- In one case the disposal of hands that were discovered much later without informing the relatives and without their authority.

The main recommendations included the following:

- Regulations should be considered covering the removal of any human material for any purpose, including identification from the victims of mass fatalities.
- Coroners and their staff should meet with families or family groups to explain procedures and keep them informed of progress.
- A senior police officer should be appointed as senior identification manager (SIM) to have overall responsibility for the identification process; this is a role distinct from the senior investigating officer (SIO) who is in charge of the overall investigation.
- All Home Office (Home Office, n.d.) guidance on emergency planning should include reference to the need to involve the coroner in emergency planning.
- The Home Office should ensure that the appropriate contingency plans are in place throughout the country.
- Consideration should be given to placing the "right" to view the body on a statutory basis.

- Honest, accurate information should be given to families as early and regularly as possible and all times thereafter. If this is not practically possible, the reasons should be explained to the families.

The Marine Policing Unit had undertaken an SAR role on the River Thames for over 20 years prior to the *Marchioness* disaster. However, after the inquiries, the government asked the Maritime and Coastguard Agency (MCA), the Port of London Authority (PLA), and the Royal National Lifeboat Institution (RNLI) to work together to develop a dedicated SAR service for the River Thames. As a result, on January 2, 2002, the RNLI set up four lifeboat stations at Gravesend, Tower Pier, Chiswick Pier, and Teddington (MPS, n.d.-a).

Conclusion

Charles Haddon-Cave of the Queen's Court, who represented the *Marchioness* Action Group (Marchioness-Bowbelle.org, N.D.), summed up as follows:

The care with which our dead are treated is a mark of how civilised a society we are. Much goes on for understandable reasons behind closed doors. For this reason there is a special responsibility placed on those entrusted with this work and the authorities who supervise it to ensure that bodies of the dead are treated with the utmost care and respect. That is what bereaved and loved ones are entitled to expect and what society at large demands.

Lord Justice Clarke (2001, p. 152) mirrored this sentiment in the conclusion of the inquiry. Recommendation 8 stipulates the following:

Coroners and Coroners' staff should meet with families or family groups to explain the identification and other procedures to be followed. They should also keep relatives informed of the progress of the identification process.

Furthermore, Clarke (2001) was critical of Knapman, who made the decision to allow the removal of the hands, stating that the coroner failed to give proper consideration to the circumstances under which the removal of the hands should be authorized—as this should have been done only as a means of last resort to achieve identification (*ibid.*, p. 44). This was of great significance in terms of lessons learned from this event since the families also highlighted their concerns with regards to the 25 victims who had their hands removed as an unnecessary part of the identification procedure: For a number of victims this action was unnecessary as they had either already been identified through dental records or property and clothing found with the body, or were identified by these noninvasive methods shortly after removal of the

hands (Marchioness-Bowbelle.org, 2000). Subsequently three cases occurred in which the hands were not reassociated with victims' bodies. Of particular note is the situation that occurred when one set of hands was found in a mortuary freezer in 1993, almost 4 years after the disaster, and then were subsequently disposed of without the relevant family's knowledge or consent. In addition, as the families were not allowed to view the bodies prior to burial they were unaware that full postmortems had been performed to determine the exact cause of death in each case.

Lord Justice Clarke (2001) stated that he hoped that the inquiry and the associated publicity would help ensure that nothing like that ever happened again and that "... the principal lesson which can be learned from this and other major disasters is the importance of respecting the dead and their relatives, of acting with sensitivity throughout and of ensuring that (save where a compelling public interest requires otherwise) full, honest and accurate information is given to relatives at every stage" (p. 14). Recommendation 5 of Lord Justice Clarke's report (*ibid.*, pp. 150–151) into the disaster will help ensure that a number of failures will not be repeated:

"It should be made clear that the methods used for establishing the identity of the deceased should, wherever possible, avoid unnecessary invasive procedures or disfigurement or mutilation and that body parts should not be removed for the purposes of identification except where it is necessary to do so as a last resort."

In support of Lord Justice Clarke's recommendations, a significant development occurred following the *Marchioness* disaster: The Coroner's (Amendment) Rules (2005) require the pathologist to make provision, where possible, for the preservation of material which they believe has a bearing upon the cause of death or the identification of the deceased. The pathologist must notify the coroner of the fact in writing; in turn, the coroner will notify the pathologist how long the material may be kept and how it is to be disposed of once it is no longer required. This aims to prevent material being misplaced, lost, or forgotten and also to limit unnecessary stress to families. The Human Tissues Act (2004) (UK Government, 2004) applies further restrictions and guidance with regards to the storage of human tissues and any other processing of human tissues.

When considering the perceived procedural weaknesses of the *Marchioness* disaster, it should be remembered that it occurred in 1989, and that the learning and development of identification procedures following this tragedy have been significant. Largely as a result of the procedural shortcomings, the resulting recommendations by Lord Justice Clarke (2001) and Detective Chief Superintendent Webb resulted in the United Kingdom making significant improvements to the preparedness framework of DVI, for both national and

international deployments. In addition, the gold, silver, and bronze command structure, initiated in the *Marchioness* incident by Commander Anthony Speed, is still used today and forms part of all major disaster plans.

One of the most significant developments to occur directly as a result of Lord Justice Clarke's recommendations was the role of SIM. Lord Justice Clarke's recommendation (2001, p. 154) reads, "In particular I support the proposal to appoint a Senior identification Manager (SIM), namely a senior police officer to have overall responsibility for the identification process." These senior officers are specifically trained to enable them to manage the whole identification process, including establishing a casualty bureau, overseeing both victim recovery and temporary mortuary procedures, and setting up the identification commission. Finally, the SIM also takes responsibility for managing and deploying family liaison officers, whose role it is to liaise with the family, keeping them fully informed at all times, and to organize the collection of antemortem data. This last point is significant because although the FLO is commonly referred to today, in 1989 the role was performed on an ad hoc basis. Unfortunately, in this case the FLOs, as Knapman's conduit of communication to the families of the victims, failed to inform the families in a timely and sensitive manner about the procedures likely to be followed with regard to the identification of the deceased, resulting in the families feeling as if the coroner had kept them the dark (Clarke, 2001, p. 45). During this disaster, it has been reported that some families were simply told to return home and that they would be contacted, while others were allocated an officer. However, even those with named police contacts had to initiate contact with the police to gain information. This situation has now been relieved with the development of the FLO. Consequently, it can be seen that a significant investment has been made in disaster management training on each and every aspect of the response to the *Marchioness* disaster, from the professionalization of the role of FLO to the introduction of the SIM and personalization of the role and responsibilities of the coroner.

This disaster will be remembered for the removal of the victims' hands as well as because it took more than 11 years for the conclusion of the inquiry and for the bereaved families to finally establish what happened to their loved ones. The significant changes that have also occurred as a result of this tragedy should also not be overlooked, as the lessons learned have been considerable—with the aim of ensuring that the same mistakes do not occur again.

References

- Clarke, K. (2001). *Marchioness/Bowbelle: Formal Investigation under the Merchant Shipping Act 1995*. Available from <http://www.marchioness-bowbelle.org.uk/> (accessed February 5, 2009).

- Home Office. (n.d.). Home Office Homepage. Available from <http://www.homeoffice.gov.uk/> (accessed February 10, 2009).
- International Maritime Organization. (1972). Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREGs). Available from http://www.imo.org/Conventions/contents.asp?doc_id=649&topic_id=257#4 (accessed April 20, 2010).
- Irwin Mitchell. (n.d.). Marchioness Riverboat Disaster: 20 August 1989. Irwin Mitchell. Available from <http://www.irwinmitchell.com/RecentWork/Marchioness-Riverboat-Disaster.htm> (accessed February 10, 2009).
- London Ambulance Service. (LAS). (n.d.). London Ambulance Service Homepage. Available from <http://www.londonambulance.nhs.uk/> (accessed February 10, 2009).
- London Emergency Services Liaison Panel. (LESLP). (n.d.-a). London Emergency Services Liaison Panel Homepage. Available from <http://www.leslp.gov.uk/> (accessed February 2, 2009).
- London Emergency Services Liaison Panel. (LESLP). (n.d.-b). *Major Incident Procedure Manual*, 7th edition.
- London Fire Brigade. (LFB). (n.d.). London Fire Brigade Homepage. Available from <http://www.london-fire.gov.uk/> (accessed February 2, 2009).
- Marine Accident Investigation Branch. (MAIB). (n.d.). Marine Accident Investigation Branch Homepage. Available from <http://www.maib.gov.uk/home/index.cfm> (accessed February 10, 2009).
- Marchioness-Bowbelle.org. (2000). Marchioness-Bowbelle Non-statutory Inquiry: NSI Part 1—Chronology. Available from <http://www.marchioness-nsi.org.uk/NSI%20PART%201%20Chronology.pdf> (accessed February 10, 2009).
- Marchioness-Bowbelle.org. (n.d.). Marchioness-Bowbelle Inquiries Homepage. Available from <http://www.marchioness-nsi.org.uk/> (accessed February 5, 2009).
- Marine Policing Unit. (MPS). (n.d.-a). Marine Policing Unit: History. Available from <http://www.met.police.uk/marine/history.htm> (accessed April 20, 2010).
- Marine Policing Unit. (MPS). (n.d.-b). Metropolitan Police Service Homepage. Available from <http://www.met.police.uk/> (accessed February 10, 2009).
- UK Government. (1988). Coroners Act 1988. Office of Public Sector Information. Available from http://www.opsi.gov.uk/acts/acts1988/Ukpga_19880013_en_1.htm (accessed February 10, 2009).
- UK Government 1995. Merchant and Shipping Act (1995). Office of the Public Sector. Available from: http://www.opsi.gov.uk/acts/acts1995/ukpga_19950021_en_1 (accessed October 2, 2009).
- UK Government 2004. Human Tissue Act (2004). Available from: http://www.opsi.gov.uk/acts/acts2004/pdf/ukpga_20040030_en.pdf (accessed October 2, 2009).
- UK Resilience 2008. Marchioness - Inquiries/Coroner's Inquests. Available from: http://www.ukresilience.gov.uk/response/recovery_guidance/case_studies/g1-3_marchioness.aspx (accessed May 2, 2009).

The Dunblane Primary School Shootings, March 13, 1996

11

NEIL BROWN

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Introduction

Dunblane as a town, and the primary school specifically, are unfortunately synonymous for many with one event that shocked the world: a multiple murder-suicide that left 17 dead and many more seriously injured. The tragic events took place on March 13, 1996, at a school, where Thomas Hamilton shot and killed 16 primary school children and their teacher, using a 9 mm Browning self-loading pistol, before committing suicide with a single shot from a .357 Smith & Wesson revolver. The resultant investigation focused on the 17 homicides, numerous attempted homicides, and one suicide, although at the end of the day the evidence was heard at a public inquiry rather than in a criminal court.

The school, which became the focus of the tragedy, was built in 1974 and on March 13, 1996, had 644 pupils enrolled aged between 5 and 11 years as well as a number of preschool children, making it one of the largest primary school populations in Scotland at the time. On the day of the incident there were no particular security precautions in place, and access to the school could be gained by way of numerous doors. Central Scotland Police (CSP) was the

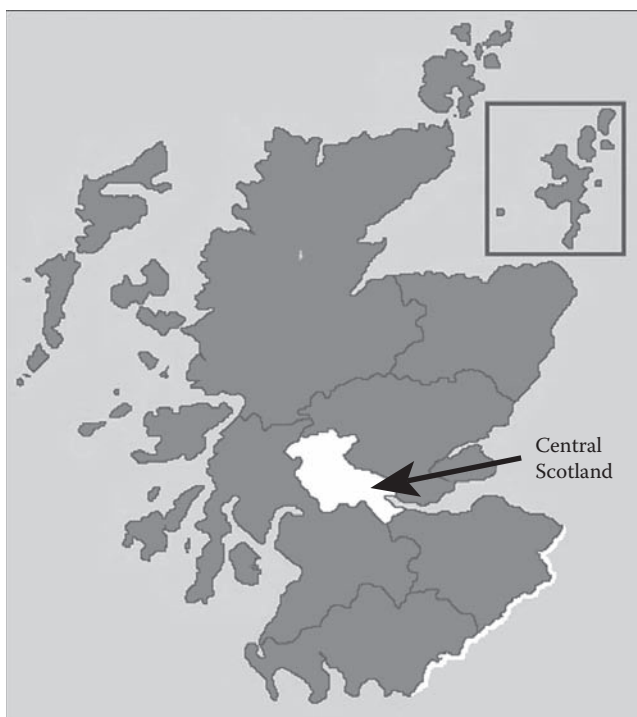


Figure 11.1 Policing regions of Scotland with Central Scotland Police boundaries highlighted.

responding force; it was and remains one of the smallest constabularies in the United Kingdom (Figure 11.1). In March 1996, CSP had a total strength of 657 officers and 230 support staff. At the time of the incident, Dunblane had at any given time around three police officers on duty, who policed not only the town of Dunblane but also a large surrounding rural area.

The Perpetrator: Thomas Hamilton

Thomas Watt Hamilton was born May 10, 1952, in Glasgow, to a 21-year-old father and 19-year-old mother. In 1955, his parents were divorced, and Hamilton and his mother moved to the home of his grandparents until he was formally adopted by his maternal grandparents in 1956. Hamilton, thereafter, went through his childhood in the belief that his natural mother was in fact his sister. In 1963 the family moved from Glasgow to Stirling, and he continued to reside there at the time of the Dunblane shootings.

Thomas Hamilton's life revolved in the main around the Boy Scouts and, later, self-established boys' clubs. Hamilton was a Scout leader in Stirling but was dismissed from the role after a number of incidents involving lack of

proper consideration for the children's welfare. Consequently, Hamilton's name was entered on a black list that denied him any future appointment with the Scout Association. Hamilton thereafter began to organize and run his own boys' clubs in direct competition with the Scout Association.

From the age of 16, Hamilton displayed an interest in firearms, and in 1977 he was granted a firearms certificate for a .22 target pistol. Hamilton held a firearms certificate for the next 19 years, renewing it at regular intervals. During this time the caliber of the weapons he held increased, with the final renewal in January 1995 being for two 9 mm Browning pistols and two .357 Smith & Wesson revolvers, one of which was a Magnum. He was also authorized to hold 1,500 rounds of ammunition for each firearm. Over the years Hamilton was a regular at gun clubs, although his attendance waned for a period of time. However, although his activities with boys' clubs were in decline leading up to the incident, his interest in firearms was resurgent, as demonstrated by his purchase of an additional firearm and a large quantity of ammunition, which included high-velocity and soft-nosed bullets in October 1995.

Examination of Hamilton's house postincident revealed that it was poorly furnished, needed decoration, and was in an unkempt condition. At the time of his death, Hamilton was in debt to several companies and organizations, including Central Regional Council, which was pursuing him for unpaid council tax. Ultimately, the council obtained a sheriff's warrant to seize his possessions for nonpayment of the council tax. Hamilton was made aware that the date for execution of the warrant was March 13, 1996—the date of the incident at Dunblane Primary School.

Everyone who came into contact with Hamilton on an official basis found him to be an awkward character, belligerent, arrogant, and consistently unreasonable. He refused to concede to the viewpoints of others if these were in conflict with his own. Nevertheless, even with the benefit of hindsight and the opportunity to review all of the information known about him, it could not be said that there was ever any clear indication he was capable of the crimes he perpetrated in Dunblane Primary School on March 13, 1996.

Circumstances

There can be no doubt that Thomas Hamilton held a grudge against society in general and Dunblane Primary School in particular (Figure 11.2). His interest in the school stemmed from an allegation that during a school assembly the head teacher had warned pupils against attending Hamilton's boys' clubs: A claim without foundation. In early March 1996 Hamilton spoke to a child attending his boys' club in Dunblane. The child was a pupil at Dunblane Primary, and Hamilton asked him on which days and at what

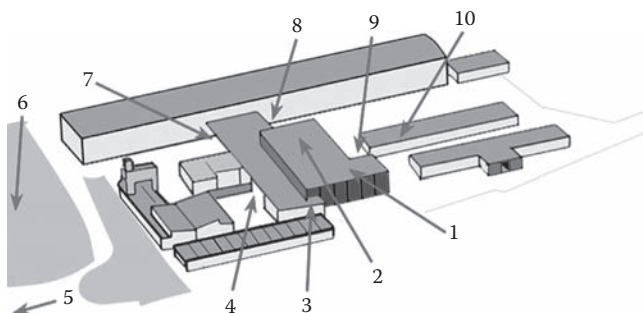


Figure 11.2 Illustration showing the layout of Dunblane school. 1, Gymnasium. 2, Assembly hall. 3, Store. 4, Entry door beside toilets. 5, Access to Doune Road. 6, Telephone pole. 7, Main entrance. 8, Library corridor. 9, Fire escape door. 10, Hut 7.

times assembly was held as well as the best door to enter and directions to the assembly hall. Although the child supplied him with some of the information he sought, he erroneously told Hamilton that the assembly was held between 9:00 a.m. and 10:00 a.m. With hindsight, there is little doubt that Hamilton's intended target on the morning of March 13, 1996, was the school assembly, but he arrived at the locus approximately 10 minutes late as the assembly had finished at 9:30 a.m.

Events of March 13, 1996

It is believed that Hamilton conducted a reconnaissance viewing of the locus prior to the attack, as a witness saw Hamilton coming from the area of Dunblane Primary School on Sunday, March 10. It is also known that Hamilton traveled to Dunblane by train on Tuesday, March 12, as well as renting a van for 24 hours from a local firm in Stirling. When he left his home on the morning of March 13 a telephone directory was left lying open at the page that included Dunblane Primary School. It is fair to conclude that Hamilton, in keeping with his lifestyle as a methodical man, made preparations for events that were to unfold and that it was certainly not a spontaneous act.

The morning of March 13 was cold, with some snow on the ground. The school janitor had prepared the school for opening by unlocking a number of doors, including the external north-facing door to the corridor leading to the assembly hall and gymnasium. The school day started at 9:00 a.m. for all primary classes. Morning assemblies were held in the assembly hall, which was situated between the dining area and the gymnasium. As the school had 640 pupils, the hall was not large enough to accommodate all of the pupils simultaneously. Consequently assemblies were held by rotation, divided by year group. On the day in question, all primary 1, 2, and 3 classes attended

assembly from 9:10 to 9:30 a.m. This group consisted of approximately 250 pupils in addition to their teachers and the school chaplain, and included Primary 1/13, which was a class of 28 pupils. Twenty-five members of the class were aged 5 years old, and three were 6 years old. The daily registration of Class 1/13 had not been completed prior to them attending assembly because the children had to change into physical education (PE) kit as they were due to commence class immediately after assembly.

At the end of assembly, the attending pupils and staff dispersed to their respective classrooms, with the exception of the students of Primary 1/13, who, with their teacher, had made their way to the gymnasium, entering by the doorway at its north end. A PE teacher was already there along with a supervisory assistant and addressed the pupils from a point near the north end of the hall, while the class teacher and the special attendant sat near the door to the gymnasium.

At approximately 9:30 a.m. a witness saw a vehicle being driven into the lower car park of the school and being parked beside a telephone pole. The vehicle driven by Hamilton which he had rented the previous day, was later recovered by the police from this same position. Here he took out a pair of pliers from a toolwrap and used them to cut the telephone wires at the foot of the pole. Unknown to Hamilton, the telephone wire he cut did not serve the school but rather the surrounding houses (Figure 11.3). He then entered the school by way of a door on its northwest side.

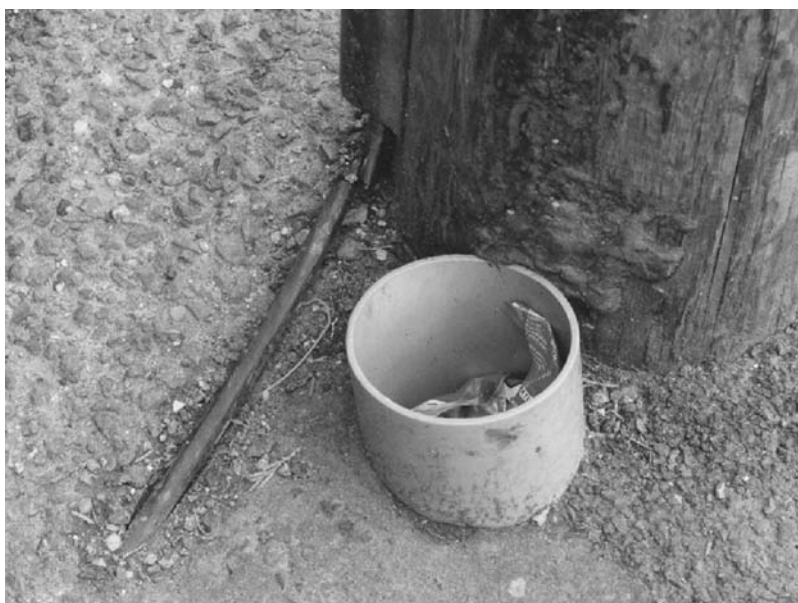


Figure 11.3 Cut telephone wire for houses adjacent to the school. (Photo courtesy of Central Scotland Police.)

The Shootings

As the PE teacher began attending to the waiting class, she heard a noise behind her that caused her to turn around. This was probably the sound of Hamilton firing two shots into the stage of the assembly hall and the girls' toilet, after which he entered the gym. He was wearing a dark jacket, black corduroy trousers, and a wooly hat with ear defenders (acoustic earmuffs) and had a pistol in his hand. He advanced a couple of steps into the gym and fired inside the gymnasium. The PE teacher and supervisory assistant were both injured but managed to access the open-plan equipment storage area, which adjoined the gymnasium, followed by a number of children. The class teacher was killed at this time.

Hamilton fired a number of shots from his position near the entrance doorway and then walked around the gymnasium, continuing his assault, shortly after which he committed suicide with a single shot. The class teacher and 15 children were killed during the attack, and a further juvenile was seriously injured. In total, they had sustained 58 gunshot wounds; 26 of these wounds were of such a nature that individually they would have proved fatal. All victims died within the gym, with the exception of one child who was declared dead on arrival at Stirling Royal Infirmary (SRI) at 10:30 a.m. Although the investigation found it was not possible to be precise about the times at which individuals were shot, it is likely that they occurred within a period of 5 minutes, between 9:35–9:40 a.m.

Policing

Hamilton's actions within the gymnasium were witnessed by a member of staff in another part of the school through a window, and on staff entering the gymnasium they found the floor strewn with bodies—some alive and some dead. At 9:41 a.m. the first emergency call was received from the school. The headmaster, one of the first to witness the scene of the shootings, later described it as “a scene of unimaginable carnage, one's worst nightmare” (Cullen, 1996, Section 3:13).

The initial police response consisted of two local constables from Dunblane, who arrived at the school at 9:47 a.m. and in turn contacted police headquarters in Stirling by personal radio. The first attending officers informed the force control room that there had been a shooting at the primary school and that there were a number of child and adult fatalities, which also appeared to include the perpetrator (Hamilton), along with a large number of seriously injured casualties.

The assistant headmistress made the first call to the ambulance service at 9:43 a.m., and the first ambulance arrived at the scene at 9:57 a.m. In total, 14 ambulances and their crews attended the school along with two teams

of surgeons, as well as doctors and nurses from two local hospitals. Due to the rapid response of the emergency services and other medical personnel, only one child was announced dead on arrival at SRI, her injuries being so serious that a recovery was impossible. No other injured child died—a testament to the hard work and dedication of the first responders. Local general practitioners (GPs) also attended at the scene, and to an extent this proved problematic as some of them became overly emotionally involved. As would be expected, although live casualties were at the scene, doctors, paramedics, and ambulance officers were all in attendance, causing an element of disruption to the crime scene. In an attempt to combat this, detective officers working with police photographers were used to quickly mark and photograph a number of productions (exhibits).

At 10:10 a.m., the emergency services declared a major incident, and the relevant procedures were put in place. As a matter of policy, CSP did not operate armed response vehicles in 1996, with these coming into service only in late 2008. However, a police firearms team was available, and it arrived and was placed on standby at Dunblane police office.

Initially chaos and hysteria reigned at the school, and this had to be managed into order. Due to Dunblane's proximity to police headquarters—approximately 8 miles—and almost a full complement of senior officers in force, in the earliest stages there were actually more senior officers at the locus than junior officers. This in itself became problematic as there were many more managers available than resources at their disposal, as police reinforcements were requested from all over the force area. Many professionals, including police officers, found difficulty coping with the immediate situation.

By 11:10 a.m. all the injured had been removed from the school. They consisted of the remaining 12 members of the class, 2 pupils aged 11 who were not in the gym when they were injured, and 3 staff members. A total of 13 had sustained gunshot wounds, 6 of which were very serious, 4 of which were serious, and 3 of which were minor. Of the remaining four victims, two sustained minor injuries, and two were uninjured. After all of the surviving victims had been removed, the immediate vicinity was made a sterile area and was photographed and videoed, and a full scene of crime examination was conducted over a number of days, including ballistics and forensic examination.

This was to be a complex investigation, involving many parties. The senior investigating officer (SIO) assigned to the incident was a detective chief superintendent (DCS) with a great deal of investigative experience, as had his deputy, a superintendent. The procurator fiscal for Stirling was also intrinsically linked to the running of the inquiry. The starburst agencies surrounding these officers included the local education department as the scene of the incident was a school. Equally for the provision of support there was

close liaison with social services, which included 27 social workers working with 27 police officers in family liaison teams. Each victim or witness identified during the course of the inquiry who might have suffered psychological damage was referred to psychological services.

The inquiry also had strong political overtones, and during the course of the investigation the Scottish Office had to be continually updated. In the early days of the inquiry there were a number of visits from eminent individuals, which not only created additional general policing problems but also required the SIO to attend and brief officials such as the prime minister, the leader of the opposition, the secretary of state, the shadow secretary of state, and Lord W. Douglas Cullen, who had been requested to chair a public inquiry into the shootings. Press and media relations also called for an enormous effort on the part of the officers involved, and obviously they had to be kept abreast of the inquiry itself. Strathclyde Police assisted by providing personnel from its media department to help manage the intense media interest inevitably generated by an event of this nature.

The inquiry itself had to be conducted in a very short time frame. It was announced that Lord Cullen would hear the first evidence at the public inquiry on May 29th, 1996, only 77 days postincident. This called for a very close working relationship between the investigators and the Crown Office. It should be borne in mind that had Hamilton lived, under Scottish legislation, the criminal trial would have commenced within 110 days of the incident.

Victim Recovery and Identification

In total, it was found that Hamilton had discharged 105 shots from a Browning 9 mm hand gun. As the scene was being examined, attempts were being made to identify the dead and injured. This in many instances had to be done by a process of elimination: The problem of identification was exacerbated by the fact that Class 1/13 had attended the school for only a relatively short period of time (less than 6 months) and their class teacher was one of the few individuals on the school staff who knew each child by sight. Unfortunately, however, she was among the fatalities. It should also be remembered that the class register had not been completed that morning and that two children in the class were unaccounted for. They were later found to be absent from school that day.

To compound the issue, some of the deceased pupils were dressed in clothing with name tags that did not relate to them; bodies were intermingled; and the nature of the injuries hampered physical identification. Despite photographs of most pupils being available, in circumstances like this photographs would have been of little value. The police therefore had to rely on nursery school staff and other school staff to assist in the identification of the dead, a very difficult task for all involved.

Overall communication proved an enormous problem. Anxious parents, friends, and relatives descended on the scene, as did the media in inordinate numbers. Only one landline telephone was available within the school, and this was continuously engaged due to anxious parents phoning in or the media making inquiries. The heavy media presence at the scene also caused an overload in the mobile phone system. Police did not have the benefit of an encrypted radio system, and an open radio system was unsuitable for sensitive messages to be transmitted. As a result, a controlled evacuation of the school had to be carried out as well as dealing with the parents of the dead and injured.

At approximately 11:15 a.m., with the growing realization that the disaster victim identification (DVI) process would be somewhat protracted, it was felt that it was imperative to bring the families of the affected class (1/13) into the school to tangibly display to them that they continued to be the main priority. Huge crowds had gathered at the school gates, which delayed transporting the parents into the rear of the school. Just before noon, the police faced the families again and in essence could only continue to affirm that fatalities had occurred. The incident commander at that time had commenced the task of reuniting the remaining 600+ schoolchildren with a parent or guardian. This required full documentation and confirmation of the identity of the receiving adult.

The room in which the police had gathered the relatives of Class 1/13 was a large teachers' staff room, which was equipped with comfortable chairs and tea- and coffee-making facilities. Helpers (nurses and doctors) were allowed into this room with one of the main advantages being a secluded entry door to this particular part of the school and its distance from the gymnasium.

On the immediate receipt of the injured victims' names, an officer was sent to bring those relatives out to an adjacent room, where they were then informed that their children were in the hospital receiving treatment. All injured pupils and their parents were reunited by approximately 1:45 p.m. This enforced method of notification resulted in parents being left within the staff room unsure whether relatives taken from the room were being told their children were alive or dead. Again, in the circumstances there was no other way of accomplishing this difficult task. During this period, police addressed the recruitment of family liaison teams in preparation to undertake the task of informing the relatives of those who had died.

By approximately 12:10 p.m., the senior police management were reasonably satisfied that everyone had been identified, when they received a message from Stirling Royal Infirmary that a child fatality there had been identified as one of the fatalities already named as still *in situ* in the gymnasium. This threw the whole identification process into confusion since a complete list of the injured taken to hospital did not exist. This occurred partially as a result of an early decision by senior management not to focus on compiling

a victim list at the scene and to focus instead on recovering and treating the injured. With hindsight, had police known the difficulties they were going to face with communications, instructions would have been given for officers to note the names of the injured, as these officers could communicate with school staff to help identify those who could not be interviewed. By approximately 1:30 p.m. all of the deceased had been identified tentatively, and all 27 teams of police family liaison officers (FLOs) as well as representatives of social services were briefed to inform relatives of the outcomes of the identification procedure.

Mortuary Procedures

The work to be undertaken at the mortuary fell into two areas: (1) the identification process; and (2) the postmortem (PM) process.

The DVI process was in essence the task of identifying the victims' bodies to the pathologist prior to PM examination. One early policy decision with regard to identification proved extremely important and went some way toward alleviating the problem of the delays already related. As parents identified their children, representatives of the family liaison team were present. They then escorted their respective families home and returned to the mortuary where the officers then identified the children to the examining pathologist. The police identifications in fact took place *en masse* at approximately 10:30 p.m. March 13, 1996, and were completed in as little as 20 minutes.

The PM process consisted of the deceased being examined by one of two teams, each having responsibility for the completion of the full examination process of their designated victims. The overall group comprised the following:

- One member of the Crown Office (procurator fiscal) and one senior police officer responsible for setting policy and overall command
- Four pathologists (two per team)
- Two police photographers (one per team)
- Two detective sergeants (DSs) (one per team)
- Four detective constables (DCs) (two per team)
- One mortician
- Four radiographers

The mortuary and PM examination rooms at SRI were of an appropriate size and sufficiently well-equipped to cope with all of the examinations. It was necessary, however, to close the facility to all other agencies, and all other service demands were diverted to another local hospital. There was actually only one PM examination room, but it was equipped with two examination tables, allowing the teams to work in proximity exchanging opinion

and information. This actually turned out to be a positive aid to the process. However, with hindsight it was recommended that a second senior police officer should assist the lead police officer in overseeing the PM examinations. Most importantly, they should control the movement of all bodies, ensuring their positive identification throughout the whole process—all victims were moved at least five times in and out of the refrigerated compartments. This would have been advantageous, as it was imperative that body identification was not compromised.

Having the Crown Office present throughout all examinations, in the form of the procurator fiscal and one of his deputies, proved invaluable to members of the team throughout that day and night. The policy decisions made by them on the spot ensured that this particularly gruesome task was completed smoothly with as little additional distress as possible. Most importantly, at an early stage, all staff members were aware of the team's objectives:

- Collecting all evidential material
- Treating the deceased in the most dignified manner possible
- Completing examinations to expeditiously release the children's bodies

The following method of processing the body of each deceased victim was then decided upon, and staff members were clearly briefed:

- Visual examination and photography
- Loose bullets recovered and dictaphone record of examination made
- Preparation for identification by relatives carried out by police officers
- Second identification by police
- FLOs
- X-ray examination for bullets
- Temporary x-ray set up with mortuary as proximity necessary
- Partial PM examination only (a policy decision by Crown Office); achieved by visual examination and the use of probes to track the entry and exit wounds of bullets and then comparison with x-rays
- No deceased child subjected to formal PM procedures

The desire to treat the bodies of the victims and their teacher in the most dignified manner possible was very intense. Throughout the process it was necessary to maintain a complete record of the movement of each body through the various processes. All examinations of children were completed by 5:00 a.m. March 14, which allowed family liaison teams to provide death certificates and to arrange for the bereaved families to take possession of their child's body that day. The teams remained the same throughout the period of this examination. All were volunteers and all refused relief, despite

the fact that a prearranged relief team arrived gowned and ready in the mortuary room. The PM examination of the class teacher and Hamilton were carried out at 10:00 a.m. March 14. Hamilton's PM indicated no abnormalities, nor had he ingested any drugs.

Obviously, there was great concern among the parents about how and when their child died. In an effort to give some form of explanation, police subsequently studied photographs, ballistics reports, pathology reports, and x-ray images, and from these they were able to ascertain the likely course of events that led to each victim's death. These details were provided in the individual's victim profile, which was supplied to the procurator fiscal.

Family Liaison Teams

A decision was made that teams would be constructed of two police officers, one of whom would have experience in child protection matters, and a trained social worker. These would be attached to each of the families involved. The purpose of the second police officer initially was to deal with matters relating to identification of the deceased for evidential purposes. CSP operates a policy of joint working with social work services on all aspects of child protection, a policy that has been in place since 1989. As a consequence of this, there has been an excellent working relationship between the agencies, and there is a considerable pool of staff that are not only trained but are also experienced in approaching more sensitive matters with a high degree of tact, sympathy, and understanding. The task of setting up joint teams to provide intensive family support was therefore considerably less problematic due to the investment made in child protection prior to this incident. It was envisioned that when this task had been completed the team would be reduced to one police officer and one social worker. Some 27 support teams were established initially to deal with the families of injured and deceased, and each of these teams contained dedicated liaison officers to specific families. This was strictly observed, and all contact with families was conducted through these teams.

Child psychologists advised that it would be good for the injured children to talk about the incident, although it was important to speak to the parents in the first instance to ensure that they were prepared for information that may be forthcoming. It was important to give parents the details of the information officers hoped to obtain by speaking to the children and to explain the needs in legal terms for evidence gathering purposes. The police were able to offer the support of a psychologist to the family if this was required, and officers were warned in the course of dealing with surviving children to be alert to the possibility of reactions on the basis of similarity of body type; that is, none of the interviewing officers should resemble Hamilton in physique or looks. It was intended at this stage to structure the contacts with the survivors, and the first visit would be to establish a rapport.

It became clear that families would have different needs, with some families requiring intensive support and others wishing more discreet contact. Considerable flexibility was therefore required. FLOs were on occasion subjected to intense questioning by parents and family members, and although it was an advantage at times not to be in possession of certain detailed information, it became evident there was a need for the FLOs to be briefed in some detail regarding the criminal investigation and its progress. It was also found useful to have petty cash available for the support teams to purchase small items such as photograph frames and locket for hair on behalf of parents who could not bear going out into the wider community.

It was found that information in the public domain was becoming extremely upsetting for families; therefore, regular monitoring of press was essential and formed part of the briefings to liaison officers. Mail interception was also found to be necessary, as some crank mail was received that deeply distressed some of the families. A process was set in place for vetting all mail to the households, effectively to spare the families unnecessary additional strain.

Crime Scene Management

On initial confirmation that the force were dealing with a major incident and a number of fatalities was involved, the appointed crime scene manager (CSM) began to collect all equipment necessary as the force did not have any form of major crime scene incident (MCSI) vehicle. The first problem identified was that the CSP held only a total of 17 body bags in stock, which were routinely used for the transportation of deceased individuals to the mortuary.

Once at the scene, the first stage of the CSM process was to take conventional negative photography and video of the exterior and interior of the school. The stage area of the school assembly hall was used as a base to set up the scene of crime equipment and as a storage area for the production officers since it was immediately adjacent to the gymnasium, although it was subsequently established that a small number of shots had been fired by Hamilton in this area.

Entry to the gymnasium was by double-swing entrance doors situated in the main corridor of the gym complex (northeast-east corner). Immediately inside the gymnasium were the bodies, including an adult female (class teacher) and a young girl lying dead next to each other. Several other young children were lying dead on the floor in various other areas of the gymnasium, and the body of an adult male (accused/deceased Hamilton) was lying at the far end of the gymnasium floor (south side). All the bodies were heavily bloodstained.

Each body had, by this time, a piece of paper lying on or beside it, with a handwritten unique reference number (URN) between 1–17 for identification

purposes. It could be seen that there were numerous bullets and gun magazines lying on the floor in different areas. An assortment of other materials, including medical debris, items of clothing, bags, and games equipment, also lay about the floor. The windows of the gym, which were full length down the west side of the building, had been covered by curtains taken from the stage area of the assembly hall and had been tied to the wall bars. A number of the gymnasium windows were smashed and had bullet holes in them.

The floor, walls, and equipment of the gym had all been damaged by the stray bullets. A mobile classroom, Hut 7, adjacent to the southeast corner of the gym, had bullet holes in its walls and windows, as did the main corridor across the playground from the southeast corner of the gym.

Pieces of card with string attached showing the body number and name of the deceased were prepared, and photocopies of the Interpol PM victim identification form were completed with the name and number of the deceased. General descriptions of the victim, including position and clothing, were noted, and a photograph was taken. The recovered victim and the completed documentation were handed over to the ambulance personnel. This procedure commenced about 1:45 p.m., and four victims were simultaneously passed to waiting ambulance teams for transport.

After all victims had been removed, police attention turned to Hamilton's body. Prior to Hamilton's body being removed from the scene it was thought prudent to have it examined by officers from explosive ordnance disposal (EOD; bomb disposal) due to the possibility that he had "booby trapped" the holdall he was carrying. Despite the fact that when such suspicions arose a full evacuation should have taken place, not to delay the identification process it was decided to allow body recovery to continue with the strict instructions that Hamilton's body was not touched until declared safe. Measurements of the gymnasium and store and gym complex corridor, as well as the positions of the bodies and position and sizes of the sports equipment, were taken to allow scaled drawings to be made.

Hamilton was found lying on his back on the floor at the south end of the gymnasium. He had a head injury, and there was a large pool of blood on the floor at his head. Lying near to the body were four handguns, several empty gun magazines, a pair of spectacles, ear defenders, and a piece of head-gear. The general position of the head and feet was marked, and then a belt containing four gun holsters was removed from his waist. Hamilton's body was then placed into an undertaker's shell and transported to the mortuary under police guard.

By mid-afternoon of March 15, a cleaning company had arrived at the scene to clean the floor of body fluid. This was to allow relatives of the deceased to view the gymnasium, as this had been a particular request as they wished to see where their child died. After consultation with various agencies, the gymnasium was demolished within a few weeks after the incident occurred.

This proposed demolition placed tight time frames on the forensic examination of the scene.

After the Event

Police Report to the Crown

In total, 65 detective officers worked continuously on the inquiry over a period of just under 3 months. The report was submitted prior to Lord Cullen commencing the public inquiry May 29, 1996, 77 days after the incident. Although the Dunblane inquiry placed great demands on Central Scotland Police, other policing demands continued including two other major incidents within days.

March 21, 1996, Lord Cullen was formally appointed by parliament to conduct a public inquiry. The inquiry's terms of reference were:

"To inquire into the circumstances leading up to and surrounding the events at Dunblane Primary School on Wednesday 13 March 1996, which resulted in the deaths of 18 people; to consider the issues arising there from; to make such interim and final recommendations as may seem appropriate; and to report as soon as practicable." (Cullen, 1996).

The inquiry was held at the Albert Halls in Stirling and sat for 26 days, opening on May 29 and closing on July 10, 1996. The whole proceedings were held in public. Shortly before the opening of the inquiry, Lord Cullen and the Lord Advocate had a meeting with the relatives of the victims to discuss any concern or anxiety they had regarding taking evidence at the inquest. With Lord Cullen's approval and in accordance with the families' wishes, details of the injuries suffered by individual victims were not explored in evidence. However, Lord Cullen was supplied with a set of files relating to the victims for his personal consideration.

The main areas examined by the public inquiry into the shootings at Dunblane Primary School were threefold: (1) control of the possession and use of firearms and ammunition; (2) school security; and (3) vetting and supervision of adults working with children.

The official publication "The Public Inquiry into the Shootings at Dunblane Primary School on 13 March 1996" was published October 16, 1996 (Cullen, 1996) and was critical of some aspects of the procedures operated by Central Scotland Police in respect of firearms certificates. Lord Cullen also made specific reference to some procedural issues on the day of the incident, although he did not make any recommendations on them. The chief constable had produced a written submission to the inquiry on these issues. The report is 174 pages long, including appendices, and consists of 28 recommendations:

23 concerning the certification system relating to section 1 firearms; 1 on the availability of Section 1 firearms; 2 on school security; and 2 on vetting and supervision of adults working with children and young people.

The UK Government answered Lord Cullen's report with a white paper (UK Government, 1996) detailing the government's response to the recommendations. In general, the government accepted Lord Cullen's advice and in particular responded to Cullen's statement of concern of the victims' families at the delay in being informed of the fate of their children, which he concluded was entirely unacceptable. The chief constable of Central Scotland Police made a written submission to Lord Cullen in which he drew attention to a number of procedural improvements designed to prevent a recurrence of this serious problem. The government stated that it would ensure that these lessons, endorsed by Lord Cullen, were disseminated to other police forces (UK Government, 1996).

In addition to the recommendations made, Lord Cullen (1996) also noted areas of excellence on the part of Central Scotland Police. In the official publication, Lord Cullen stated (Stirling Council, 1996: paragraph 7.4):

"Although the Police had received training for emergencies and had participated in disaster planning they could never have envisaged an incident of such magnitude and including such disastrous circumstances. ... It is important to keep in view the general quality of the work which was done by Central Scotland Police."

He refers to expressions of gratitude received in respect of help, support and professionalism of the force, and the sensitivity and support provided to relatives by members of the liaison teams (*ibid.*).

References

- Cullen, W. D. (1996). The Public Inquiry into the Shootings at Dunblane Primary School on 13 March 1996. Available from <http://www.archive.official-documents.co.uk/document/scottish/dunblane/duncntnt.htm> (accessed March 3, 2010).
- Stirling Council. (1996). Chief Executive's Service: Response to the Cullen Report. Available from <http://minutes.stirling.gov.uk/pdfs/scouncil/Reports/Microsoft%20Word%20-%201bn96r06.pdf> (accessed June 1, 2010).
- UK Government. (1996). Government Response to the Public Inquiry into the Shootings at Dunblane Primary School on 13 March 1996. Available from <http://www.archive.official-documents.co.uk/document/scottish/dunreply/response.htm> (accessed March 3, 2010).

The Omagh Bombing, Saturday, August 15, 1998

12

JOHN MIDDLEMISS

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Introduction

At 3:10 p.m. Saturday, August 15, 1998, a 500 lb. bomb in the form of an improvised explosive device (IED) detonated in the market town of Omagh, Northern Ireland. The device had been hidden in a car by a member of the Real Irish Republican Army (RIRA), a dissident republican terrorist group. In total, 29 people lost their lives as result of the attack, and a further 250 people were injured, many of them seriously. The Royal Ulster Constabulary (RUC) was the responding police force.* The response to this incident was to be the first deployment of their body recovery and identification team (BRIT), which comprised 25 officers from various disciplines of the service, of which 18 were deployed to this incident (Figure 12.1).

Background

Northern Ireland has a population of around 1.75 million and comprises six counties: Antrim, Armagh, Down, Fermanagh, Londonderry, and Tyrone. Omagh is the county town of Tyrone and is situated approximately 65 miles from Belfast, and 35 miles from Londonderry. A market town, it has a population of approximately 50,000. Historically, Omagh was a garrison town and home to the Royal Enniskillen Fusiliers. At the time of this incident

* The RUC was not replaced by the Police Service of Northern Ireland (PSNI) until November 2001.



Figure 12.1 UK police region of Northern Ireland, with the Royal Police Service of Northern Ireland boundaries highlighted.

the resident regular army battalion was the Queen's Lancashire Regiment as well as a battalion from the Royal Irish Regiment (RIR). Like most towns in Northern Ireland, Omagh had experienced terrorist activity in the past via IEDs with attacks on military targets and the town center, in particular the courthouse. As was customary during the "Troubles," Omagh also experienced its share of "hoax" bomb calls directed at various buildings within the town.

Circumstances

Omagh has a thriving shopping center that services the surrounding rural-ity. On Saturday, August 15, 1998, it was particularly busy; the school term was due to commence in 2 weeks, and it was a particularly bright and warm summer's day. A large number of young people, tourists, and families with children crowded Market Street, the main shopping area. August 15 was no different from most summer Saturdays until the bomb warnings, of which three were made that afternoon:

1. 2:29 p.m., Ulster Television, Belfast, received a bomb warning: *"Hello Newsroom, Bomb, Courthouse, Omagh Main Street, 500lbs, explosion 30 minutes."* The code words "Martha Pope" were given.
2. 2:31 p.m., Ulster Television, Belfast, received a second call: *"Martha Pope 15 minutes bomb Omagh town."*
3. 2:32 p.m., the Samaritans received a warning call: *"Am I through to Omagh? This is a bomb warning. It is going to go off in the center of Omagh in 30 minutes time. Martha Pope."* When asked to clarify the location the caller said: "Main Street about 200 yards up from the courthouse."

The code words used had been given in a similar bomb warning a few weeks earlier. Following that occurrence, an IED was detonated in the center of Banbridge in County Down, causing major structural damage to surrounding buildings but fortunately no deaths and few injuries. Consequently, this latest warning was treated as a genuine threat.

The courthouse in Omagh is situated in the main section of the town, which is a long linear street lined with shops, offices, and a medium-sized hotel. It stretches for some hundreds of yards from Dublin Road along Market Street, past Bridge Street into High Street and on to the courthouse (Figure 12.2). Vehicular and pedestrian routes run off to either side along its entire length. On receipt of the bomb warning, the nine police officers on duty in the locality of the town quickly deployed to the area around the courthouse. In addition, 13 other officers from outlying stations and part of a divisional mobile support unit (MSU) who were in the vicinity also responded to the telephoned warnings. They were faced with the mammoth task of trying to evacuate and cordon off the area.

The warnings gave no description of the vehicle containing the device. Many unoccupied vehicles were parked by the roadside, and any of them could therefore have contained the bomb. This made it impossible for police officers to focus on a known vehicle and evacuate people to safety in a particular direction. Nor was there any identified point of danger to which they could indicate to encourage people to evacuate the area swiftly. As a result, the officers evacuated people away from the courthouse into Bridge Street and down Market Street, toward Dublin Road—directly, as it transpired, into the immediate vicinity of the explosive device (Figure 12.3).

At 3:10 p.m., the motor vehicle borne IED (MVIED) exploded. It had been placed in a red Vauxhall Cavalier car, registration mark MDZ 5211, which had been parked in Market Street approximately 365 yards from the courthouse. The device consisted of approximately 500 lbs. of homemade explosives (HME) and was initiated by a timer power unit (TPU) composed of a battery and timing mechanism contained in a plastic lunch box. The car had been stolen approximately 60 miles away, between 11:00 p.m. August

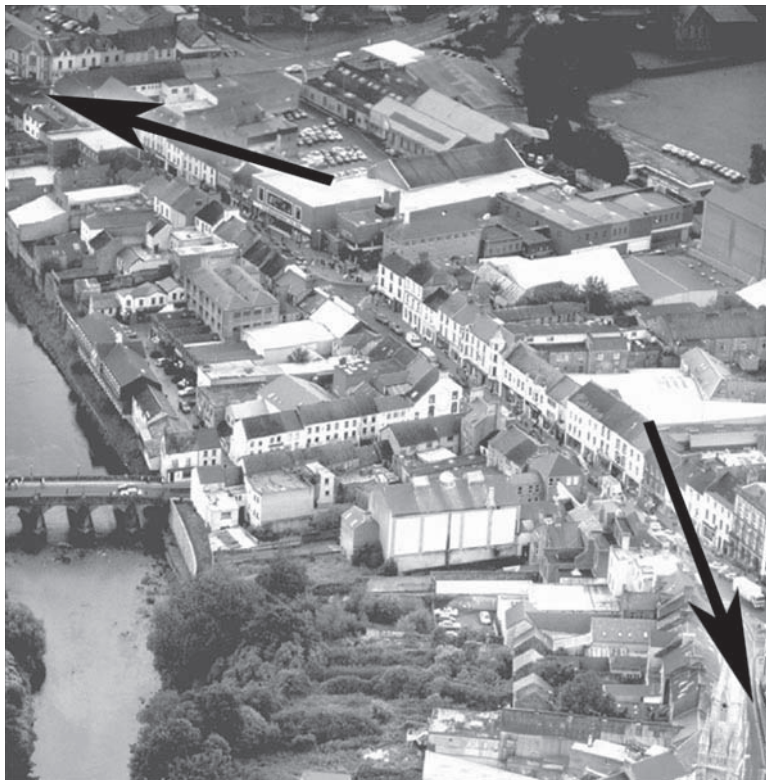


Figure 12.2 Photograph showing the area where the bomb was placed: Bridge Street (over River Strule) and Market Street, showing junction with Dublin Road (top left); the courthouse (bottom right). (Photo courtesy of Police Service of Northern Ireland.)

12 and 3:30 a.m. on August 13, from Carrickmacross, County Monaghan, Republic of Ireland, where the owner had parked it overnight.

In the immediate aftermath of the explosion, those persons either uninjured or slightly injured by the blast and its effects tried to help those unable to help themselves. Police officers also caught in the explosion worked hard to bring order to the chaos that ensued. Medical assistance at the scene came from both military personnel from the nearby barracks and civilians. The injured and dying were transported to the Tyrone County Hospital, Omagh, in every type of conveyance, from ambulances to buses and motor cars. The local hospital was soon overrun with casualties, and doctors worked tirelessly in hospital corridors as wards filled and overflowed. Injured people were taken by ambulance and military helicopter to other hospitals in Londonderry and Belfast that had specialist trauma facilities. One such ambulance conveying injured to Belfast was involved in a road traffic collision (RTC) with a car, which resulted in the death of the car's occupant.



Figure 12.3 Market Street at its junction with Dublin Road. Red arrow indicates position of the MVIED. (Photo courtesy of Police Service of Northern Ireland.)

A total of 28 people died that day as a result of the IED, and one other person died in the hospital 2 weeks later from injuries received. With the exception of two Spanish tourists and three young boys from the Republic of Ireland, the dead were all Northern Irish. Of the deceased, 7 were adult males and 13 adult females, and of the 9 children who died 4 were male, and 5 were female. The ages of the deceased ranged from 18 months to 66 years; of these 13 were under 20 years of age, and a further 3 were under 10 years. These figures do not take into account unborn twins of 39 weeks' gestation who, together with their mother, grandmother, and 18-month-old sister, were killed in the explosion. In addition, approximately 250 people were injured, many of them seriously. Some of the injured suffered loss of limbs, either as traumatic amputations at the scene or later in hospital.

Victim Recovery and Identification

At the time of this incident, local councils in Northern Ireland had no statutory responsibility for major disaster planning. However, the RUC had prepared for an event of this nature. As a result, during 1995 the RUC recruited and trained a body recovery and identification team (BRIT). The team members were tutored in all aspects of disaster victim identification (DVI) work from scene search and body recovery to exhibits and mortuary procedures.

This meant that all team members could undertake any role required of them. As part of this preparation, a contingency plan had been drawn up for the recovery and identification of deceased victims following major disasters. Temporary mortuary sites were identified at secure locations (given the security situation at that time), and equipment for these facilities was retained in storage by police and the state pathologist for Northern Ireland. The first deployment for BRIT was in the aftermath of the Omagh bomb.

Though best practice in body recovery and indeed crime scene preservation would recommend that bodies are left *in situ* for evidencing and forensic recovery, this was not practicable at Omagh for a number of reasons:

- The street in which the device detonated was very crowded with people. Those not injured were looking for friends and loved ones among the rubble.
- Nine police officers were on duty in the town and were in the process of clearing the area when the device detonated.
- It was not possible for the limited number of police at the scene at the time of the explosion to stop people from moving the bodies of their loved ones.
- Being a small country town, Omagh had a limited number of police resources immediately available to cordon off and evacuate the area of explosion.
- Some police officers at the scene had themselves been caught up in the explosion and were suffering from shock and other physical injury.
- The rescue of a large number of persons suffering from life-threatening injuries had to take precedence over the recovery and evidencing of the dead.

Once the casualty evacuation was completed, a police sergeant, himself a victim of the explosion, took control of the immediate scene and established search lines using both police and fire service personnel. They searched the street and surrounding retail and business premises for casualties. As the media were arriving at the scene it was decided to move the deceased victims still lying in the street into a shop and adjoining alley to await transportation to a mortuary holding area, which had been established in a gymnasium at the nearby Lisanelly Army Barracks, home to the Queen's Lancashire Regiment. Military doctors attended the scene and confirmed the death of some victims. Police at the scene numbered the bodies consecutively, thereby providing a unique reference number (URN) for each victim. When transport became available, they accompanied the bodies to the mortuary holding area to prove continuity.

Although a callout system had been set up with names and contact telephone numbers of all BRIT members held in the Belfast regional control

room, only one telephone call was made: to the detective superintendent, who led this deployment since he had responsibility for the team. He was not at home that Saturday afternoon, and a vague message was left on his answer phone with no indication to what it referred. It was several hours before the detective superintendent returned home and, having established what had occurred, contacted BRIT team members to meet him in Omagh. By the time BRIT members had been called out and had traveled from various parts of the province to Omagh, the majority of the deceased had been transported to the temporary holding area, and the remainder were en route. On arrival, the detective superintendent made the decision not to change the body numbering to the national body label to avoid conflict with notes made by officers at the scene who had been party to the initial numbering and recovery exercise.

During Saturday evening a casualty bureau was opened in Belfast, but communication was problematic as a result of the bomb damage to landlines in the area and mobile telephone networks being jammed with traffic. A relatives' reception center was set up in the local leisure center and was staffed by both police and civilians. Antemortem (AM) information obtained there was relayed to casualty bureau and then on to the mortuary holding area where comparisons were made with the postmortem (PM) data, thereby assisting the identification process. As the majority of victims were from the locality, information and descriptions of suspected victims flowed relatively quickly from the nearby relatives' reception center. This mechanism worked particularly well for the identification team. This was further advantaged by the fact that many of the deceased had been with friends or family when the IED had detonated. Therefore, descriptions of clothing and possessions provided to the mortuary holding area were found to be accurate. Further information was also available from police officers at the scene, as some of the victims were known to them. On August 16, the day following the explosion, staff from the RUC occupational health unit (OHU) set up a temporary office within the Omagh police station to assist all police officers involved in the events surrounding the explosions.

During the initial 48 hours postincident, police officers were deployed to Omagh from throughout Northern Ireland, some of whom were tasked with obtaining AM data and samples for comparison. As there were no trained family liaison officers (FLOs) within the RUC at that time, during the team's initial hours of deployment a decision was made by the BRIT team leader and the senior investigating officer (SIO) that BRIT members with Criminal Investigation Department (CID) experience would obtain witness statements to prove, where possible, death and subsequent identification of the deceased. Although not an ideal situation, this was agreed due to the limited CID resources available during the initial days of the incident.

The identification process began with visual descriptions being recorded and the commencement of completion of the Interpol pink (PM) DVI forms.



Figure 12.4 Viewing area in playing field changing room (original top and dressed bottom): furnishings and flowers were supplied from the officers' mess, and the cross came from the garrison church. (Photo courtesy of Police Service of Northern Ireland.)

The deceased were searched and items recorded. The military provided an area within the confines of the barracks (a sports changing room) for families to view the deceased, both for potential identification and to assist with the grieving process (Figure 12.4). They provided furniture, drapes, flowers, and refreshments to make the viewing area as comfortable as possible for the bereaved. A family area was similarly provided and dressed (Figure 12.5)

Daily meetings involving Her Majesty's (HM) coroner for the area, the pathologists, investigating police, and BRIT team leader were held to discuss identification progress and parameters. The Northern Ireland state pathologist stipulated that all PM examinations would be carried out at the local psychiatric hospital's mortuary. Knowing that this mortuary had limited storage



Figure 12.5 Family area in playing field changing room (original top and dressed bottom): furnishings and flowers were supplied from the officers' mess. (Photo courtesy of Police Service of Northern Ireland.)

facilities, the police arranged for the bodies to remain at the army camp and to be held in refrigerated containers supplied by the military. The bodies were then transported by undertaker's transport to and from the mortuary accompanied by uniformed police, thus ensuring continuity. The transportation process caused some minor delays due to traffic congestion and road closures resulting from the explosion. A better option, perhaps, would have been to set up a temporary mortuary within the confines of Lisanelly Barracks as envisaged in the police contingency plan.

The full PM examinations commenced the day after the explosion, on Sunday, August 16, 1998, and continued for 2 days. A number of body parts and other identified pieces of human tissue were recovered from the scene and were brought to the mortuary holding area. Some were identified as belonging to the deceased, whereas others belonged to casualties who had been taken to hospital suffering from serious injuries. These items were identified by way of physical matching, taking into consideration age and size of the victim, footwear, suntan marks, and nail polish. Some small fragments of human tissue were not identified and were destroyed on the instructions of the coroner once all the deceased had been positively identified.

During the search of the deceased, clothing, documents, and other personal items were recovered that assisted in their identification. In addition, a camera was found in the possession of the Spanish nationals. The film it contained was developed, and the last photograph taken had been of two other members of the victim's holiday group, ironically standing directly in front of the vehicle containing the IED. In the photograph a number of other victims were also identified, so the picture must have been taken a very short time before the device detonated. It is worthy of note that the two persons who were the subject of the photograph were not killed; however, the photographer was.

BRIT staff members worked almost nonstop for the first 30 hours of their deployment. This effort resulted in all bodies being identified by the early hours of Monday, August 17, 2 days postincident. Sufficient rest and refreshment were given little consideration and in the pressure of work were forgotten. It should be noted that at the final BRIT debrief team members admitted that they would not have stopped working even if the facility had been available. It was initially solely due to the goodwill of the resident officers of the military battalion that food was supplied and eaten *in situ* while work in the mortuary holding area progressed. Police catering was eventually supplied to the mortuary teams from the third day of the incident. To the detriment of the detective superintendent, these issues were largely ignored during the initial pressures after the bombing. The personal protective equipment (PPE) available to the BRIT members was limited and insufficient for the task at hand. Official consideration and guidance on matters relating to team health and safety were in their infancy in 1998, and no

budget had been allocated for such items. The military commander made sleeping accommodations available to the team members for the duration of their stay. However, facilities were sparse and the accommodations noisy. Green sleeping bags—the same color as body bags—were loaned and, although very welcome, were not conducive to settling an individual's mind before sleep. These facilities were in stark contrast to other police drafted into Omagh, who were accommodated in hotels and boarding houses. This clearly shows that, although many elements of the identification procedure were undertaken with excellence, this lack of consideration for the team's health and welfare was a procedural shortcoming.

The BRIT mortuary team continued completion of the Interpol PM DVI forms on all victims, and the coroner directed that three forms of identification would be required from the following list: visual, physical description, clothing worn, documentation, jewelry, scars, fingerprints, dental records, and DNA. As the majority of the victims were from the Omagh area, they were easily recognized by their loved ones, and in many cases local police officers knew them. Consequently, the visual identifications were carried out by family members and friends of the deceased, as in the majority of cases the faces of the deceased were not damaged. In the case of badly disrupted bodies, fingerprints were obtained, and positive matches were made with AM data. One victim was identified through odontology, and although samples for DNA were taken from all victims they were not used for the identification process. Of the victims not originating from Omagh, two were Spanish nationals, and a further three were from the Republic of Ireland. Information relating to these individuals was obtained through the casualty bureau and the Foreign and Commonwealth Office. These five victims had been part of a youth group visiting Omagh that day. The Spanish nationals were visually identified by three of their group leaders together with items found on their person and description of clothing worn that day. The three boys from the Republic of Ireland were visually identified by their parents together with descriptions of clothing worn that day. It is accepted that visual identification is not regarded as a primary source* of identification in major disasters. However, the Omagh incident was peculiar in that most of the victims were known locally or were accompanied by friends and family at the time of their death (Figure 12.6). Therefore, the issue of identification was less problematic than if the victims had been the subject of an incident in a major conurbation.

In Northern Ireland, burials generally take place within 2 or 3 days of an individual's death. Consequently, as the majority of the deceased were local residents, relatives and undertakers put significant pressures upon senior

* Today, four identifiers comprise primary sources: DNA, fingerprints, odontology, and unique medical condition (UMC).



Figure 12.6 Photograph taken by Spanish tourist immediately prior to explosion showing the vehicle containing the MVIED.

divisional police for the swift repatriation of the bodies. Quite correctly, investigating police resisted pressures, and the coroner authorized release of the bodies only once all identifications were confirmed. They were then made ready for release to the families' chosen funeral directors in accordance with a release plan previously agreed with the coroner. Security considerations at Lisanally Barracks dictated that bodies be released from another location. The release plan agreed was for bodies to be repatriated from the psychiatric hospital where the PMs had taken place. Space was also identified there for undertakers to perform cosmetization. In the event of pressures applied upon police command by both the bereaved and undertakers, the divisional police commander at that time agreed with undertakers that the bodies should be collected from Lisanally Barracks. This change of plan was not passed to either the BRIT team leader or the military commander. This resulted in a number of undertakers arriving unannounced at the barracks, much to the consternation of the military commanding officer. Furthermore, families and undertakers were kept waiting, a situation that had the potential to cause great distress to the bereaved. The unscheduled change also meant that the facility for the cosmetization by the undertakers had to be hurriedly

put together within the mortuary holding area. Having considered the potential effects upon the bereaved should the undertakers be turned away empty-handed from the barracks, with the cooperation of the military commander it was decided to release the bodies from that location. This repatriation process took place throughout the Tuesday evening and Wednesday morning with the bodies being released to the respective undertakers against receipt. Special arrangements were made to have the two Spanish nationals encoffined and returned to Spain in military transport.

Once the bodies were repatriated, the BRIT team occupied a classroom in the army barracks and compiled a file on each of the deceased and each body part. The file contained statements proving identity and evidential continuity and contained an index indicating what statements had not been obtained. Outstanding statements were subsequently obtained by the investigation team. On the completion of the BRIT tasks on Sunday, August 23, copies of the files were handed to the nominated coroner's liaison officer (a police sergeant) and the officer in charge of the Home Office Large Major Enquiry System (HOLMES; information technology system used by UK police forces) incident room. Exhibits used during the identification process were handed to the investigation exhibits officer.

After the Event

To date no one has been convicted of the Omagh bomb atrocity. On August 17, 1998, the RIRA, a dissident republican group, telephoned Radio Telefis Eireann claiming responsibility for planting the device. The following morning at 10:30 a further call was made to "Ireland International," Dublin, when the caller attempted to justify the explosion warnings and said, "It was not our intention at any time to kill any civilian." The caller also offered his apologies. Later that same day a journalist received a telephone call from a male who stated that as result of the Omagh bomb and appeals by politicians and others his organization was "embarking on a process of consultation" and in the meantime "all military operations have been suspended from 12 midnight."

As with all events of this nature, lessons are learned that can be applied on future deployments. The work and understanding of DVI issues have progressed since 1998. The introduction of senior identification managers (SIMs), FLOs, UKDVI training, and the Human Tissue Act 2004 have all impacted this very necessary role. If the Omagh bomb were to occur again in a small county town, the factors that influenced the body recovery operation then would have the same influence today. However, mortuary and identification procedures would be dealt with differently. For example, the ready availability of resilience mortuaries would enable PM procedures to be performed in appropriate conditions removing the need for temporary facilities.

In addition, police officers trained as FLOs can assume the task for which they are trained, thus removing the obligation from BRIT members of dealing with bereaved. Finally, in terms of the health and safety of BRIT members, they now have adequate personal protective equipment at their disposal to enable them to carry out their task.

Since 1998 the BRIT team within the RUC, and subsequently the Police Service of Northern Ireland, has grown in numbers through additional training courses and has been accepted within the service as a necessary prerequisite to disaster planning rather than the “poor relation” or “afterthought” as it appeared to be initially viewed. In addition to the provision of equipment and an annual budget, team members have carried out work in Thailand in the aftermath of the Asian tsunami that occurred December 26, 2004, and at various incidents within their own police area. They also now form an integral part of the national DVI team.

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Introduction

Train travel has been a popular means of transport since the early 1880s when the first steam trains were introduced in the United Kingdom, with a network of rail lines developing quickly, cover most of the United Kingdom. As they became more popular with improved design and comfort, so came the associated increase in size of the trains themselves and increased potential top speeds. This also resulted in amplified passenger capacity, as it was by far the most efficient way to access areas of the country.

Unfortunately, ever since there has been a history of rail travel, there has been a history of rail accidents. As with any series of disasters the numbers of victims, both those that lose their lives and those who are injured, is dependent on the circumstances of the incident and the ability of others to respond to the disaster efficiently and effectively. The number of fatalities in any one incident can vary depending on a number of factors. In fact, these incidents may result in relatively few fatalities in relation to the number of people involved. For example, consider the accident in Abergele, North Wales (1868) in which around 30 people died although the definitive number of deceased and injured victims is unknown; Ladbroke Grove (1999) in which 31 people died; or the incident at Ufton Nervet, Berkshire (2004) when 7 people were killed and a further 71 injured. That these events do not always result in large numbers of deceased in no way detracts from their significance; every death is of intense importance to the families of the loved ones left behind.

Rail accidents are usually treated as mass fatality incidents (MFIs), with the associated elements of a deployment such as disaster victim identification



Figure 13.1 Map showing the three regions in which the rail incidents occurred (13.1, Thames Valley; 13.2 and 13.4, Hertfordshire; 13.3, North Yorkshire).

(DVI) team attendance and resilience mortuaries. This is because a mass fatality event is defined as an incident the local emergency services cannot deal with in isolation—often as a result of the numbers of victims or because of the fragmentation suffered by the victims or the size of geographical area the incident covers. Consequently, since rail crashes can involve large numbers of injured or deceased victims (especially if two passenger trains are involved in a collision) and there is often a considerable area of wreckage to process, these incidents are complex and include the involvement of numerous first responder agencies. Situations are compounded by the intense media interest that these events generate; consequently, extraneous factors such as a suitable press strategy must be considered at the outset for the victims and their families to be afforded the respect and dignity they deserve. Through experience, lessons regarding how best to respond to these events have been learned—not just in the police region in which they occur but also in other police forces to help improve the service following future events (Figure 13.1).

This chapter focuses briefly on four rail crashes that occurred in a period lasting just over 2 1/2 years, from October 1999–May 2002. Discussion is restricted to what in general were considered successful aspects of the

Table 13.1 Rail Disasters Covered in This Chapter

	Date	Location	Force	Deceased	Injured	Public Inquiry
1	October 5, 1999	Paddington rail crash	Thames Valley Police	31	523	Lord Cullen: Led to the creation in 2003 of the Rail Safety and Standards Board
2	October 17, 2000	Hatfield train derailment	Hertfordshire Constabulary	4	70	None
3	February 28, 2001	Selby/Great Heck rail crash	North Yorkshire Police	10	82	None
4	May 10, 2002	Potters Bar rail incident	Hertfordshire Constabulary	7	76	None

recovery and identification procedures used as well as elements requiring attention following these specific events.

The incidents covered in this chapter occurred in different police force jurisdictions. As the main Eastern Line extends from Scotland to London it passes through the jurisdiction of Hertfordshire Constabulary (HC), just north of London, and as a result of the high numbers of trains passing through the county, HC has experienced a number of rail crashes. Both the Hatfield rail crash October 17, 2000, and the Potters Bar rail crash February 10, 2002, took place in Hertfordshire's force area, and both involved the need to mobilize a mass fatality response.

An additional component of the response to rail incidents is that the British Transport Police (BTP) takes primacy, as it has control over any incident involving the rail system, including rail lines, rail passengers, and freight traveling the British Rail network. BTP works with local police forces in this type of situation and was an integral part of the response to the rail incidents described in this chapter. Rail crashes are complex events, with many agencies working together. Interagency cooperation is imperative to perform a successful victim and evidential recovery deployment; although many train crashes are accidental, the cause is not known at the beginning of the investigation, and criminal charges including negligence or manslaughter may follow.

Circumstances

Paddington

The Paddington rail incident, also known as the Ladbroke Grove train crash, occurred October 5, 1999 (ORR, n.d.-d). In total, 31 people were killed, and a further 523 were injured. The service affected was the Paddington to Bedwyn, Wiltshire, which consisted of a three-car multiple-carriage passenger train, operated by Thames Trains. The train had left the home station as usual at 8:06 a.m. Only 2 minutes later, at 8:08 a.m. and 58 seconds, it collided with a nine-carriage First Great Western high-speed train (HST). The incident took place at Ladbroke Grove Junction, approximately 2 miles west of the terminus at London Paddington train station (HSE, 2000), an area covered by Thames Valley Police. The trains collided almost head on at the junction with a combined closing speed of approximately 130 mph (Figure 13.2).

The first car of the Thames train, driven by Michael Hodder, was destroyed on impact, and the diesel carried by this train ignited, causing a series of separate fires in the wreckage, particularly in Coach H at the front of the HST, which was completely burned out. The 31 deceased victims included the drivers of both trains. Of the 523 injured, 227 people were



Figure 13.2 Paddington train crash. (Photo courtesy of Adrian Dennis/Rex Features.)

admitted to hospital, with the remaining 296 treated at the site of the crash for minor injuries.

The immediate cause of the disaster was identified as the Thames train passing through a red stop signal—the now infamous Signal 109—563 meters before the impact point. However, the public inquiry conducted over the next year by Lord William Douglas Cullen, identified many contributory factors, including Thames Trains’ driver training procedures: Hodder had qualified only 13 days earlier; there was no documentary evidence of him being taught anything about the complexities of the route; and his drivers’ rules examination paper neither bore his signature nor had any “pass/fail” ticks on it to indicate that any subjects had been discussed (Cullen, 2001a, 2001b). Also identified was Railtrack’s Great Western Zone (the company responsible for the maintenance of the track and signaling), which had not taken appropriate action in view of the fact that there had been eight red danger signals passed at Point 109 in the preceding 6 years (although all those trains stopped before reaching the junction) and had not taken sufficient action in response to complaints from train drivers about the visibility of various signals, particularly Signal 109.

The incident was under the jurisdiction of the Health and Safety Executive’s (HSE’s) Her Majesty’s Railway Inspectorate (HMRI), responsible for the encouragement, regulation, and enforcement of workplace health, safety, and welfare and for research into occupational risks in England, Wales, and Scotland. The HSE was created by the Health and Safety at Work

Etc. Act (HSWA; 1974) and is the primary piece of legislation covering occupational health and safety in the United Kingdom; the HSE is responsible for enforcing the act and a number of other acts and statutory instruments that aim to secure the health, safety, and welfare of persons at work. The HSE Act of 1974 absorbed earlier regulatory bodies, as HMRI merged with the Office of Rail Regulation (ORR, n.d.-a) on April 1, 2006, as a consequence of which the responsibility for the regulation of health and safety on the railways was transferred from the Health and Safety Commission (HSC) and HSE to the Office of Rail Regulation (ORR, n.d.-c). The HSE did not escape criticism, most of which related to its inspection procedures, and the Railtrack signaling center staff members at Slough were criticized for not sending a radio “emergency—all stop” signal immediately when it was realized that the Thames Train had passed a signal at danger (red). Since trains had always come to a stop shortly after the signal in the past when running a danger signal at 109, the signaling center staff members were expecting the train to stop. It is not known if the radio signal eventually sent was received before the impact 33 seconds later (Cullen, 2001a, 2001b).

As a result of this incident, Lord Cullen was appointed to chair a public inquiry into the cause of the crash (Cullen and Uff, 2001). The inquiry was held under Section 14(2) of the HSWA (HSE, 1974). Initially, an inquiry focused solely on the Southall rail accident (September 19, 1997) was launched; however, due to this having been significantly delayed as a result of criminal proceedings being brought against the driver and the train operating company, the inquiry hearings did not commence until September 20, 1999. A little over 2 weeks later, on October 5, the rail incident at Ladbroke Grove occurred. It was subsequently decided that a joint inquiry would be conducted into the incidents, as both related to health and safety on the railways (Cullen and Uff, 2001).

The inquiry was divided into two parts. Part 1 was concerned with the investigation of the causes of the crash and the circumstances in which it occurred as well as lessons that could be learned from what happened and recommendations for improved safety (Cullen, 2001a). Recommendation 4 (paragraph 4.122) suggested that the railway group review its emergency planning systems, including liaison with the emergency responders, and improve its preparation for the aftercare of survivors and the provision of support and associated facilities for the bereaved and injured (Cullen, 2001a, p. 226). Part 2 focused on the management of safety and the regulatory regime and included the recommendation that a new rail industry body should be formed, independent of any rail company as well as the safety regulator (Cullen, 2001b).

Hatfield

On October 17, 2000, at 12:10 p.m., a Great North Eastern Railway (GNER) intercity train bound for Leeds left London King’s Cross (ORR, n.d.-c). At

12:23 p.m., at speeds in excess of 115 mph (Jack, 2001), the train derailed south of Hatfield Railway Station, Hertfordshire (Figure 13.3). It later transpired that the accident occurred due to the train crossing a broken rail while traveling at high speed near Hatfield Station, 17 miles north of London. The rail had fragmented, causing the train to derail from the third coach onward, in the process of which carriages swung out and hit line-side structures. As a result of the collision, four people died, all of whom were in the buffet car at the time of the derailment, which impacted, roof first, into one of the supporting posts for the overhead power cables. Others also present in the buffet car were the most severely injured of the survivors. The whole crash took 17 seconds from the moment the train passed over the rail to it coming to a complete halt 600 meters farther down the track from the impact site.

HC was the responding force, although BTP had primacy over the investigation in accordance with the Work-Related Deaths Protocol (Independent Investigation Board, 2006): This protocol is cosigned by the Association of Chief Police Officers in Scotland (ACPOS), the BTP, the Crown Office and Procurator Fiscal service, and the HSE (2003).

The first emergency call was received by HC at 12:24 p.m. (HC, 2001). The emergency calls triggered a mass disaster response from the emergency services. HC had already experienced disasters and as a result had created the Hertfordshire Emergency Services Major Incident Committee (HESMIC). Unfortunately, the HESMIC had been put into practice a number of times, including the response to the Watford rail incident, which took place August 8, 1997, when the 5:04 p.m. from Euston to Milton Keynes passenger train collided with an empty train just south of Watford Junction Station. One person died as a result of the crash, and a further 70 were injured (HC, 1997).

The initial and most important part of any mass disaster response is the safety, rescue, and treatment of any survivors. Of the 170 passengers and 12 GNER staff onboard the train at the time of the derailment, 70 were injured, 4 of them including two of the GNER staff severely (Independent Investigation Board, 2006). Initially the wounded were taken to a holding area where they awaited transport to hospital; subsequent reports highlight the error of the placement of the media corral, which was located beside this holding area, causing some intrusion into the privacy of those who had been injured. This type of error highlights how easy it is to overlook problems in the initial response to any disaster.

An investigation into the crash was launched. A draft report was leaked to the media, which stated that Railtrack—the company responsible for track maintenance—knew of the rail defect 2 years in advance of the incident. Quarterly ultrasound tests had shown the rail to be suffering serious fatigue, and later it was shown that the rail had deteriorated rapidly with cracks appearing, some of which were over 4 inches long. Following reconstruction of the rail, it was determined that on impact the rail disintegrated into



Figure 13.3 Hatfield train crash. (Photo courtesy of East News/Rex Features.)

approximately 300 separate pieces. The government then ordered an internal inquiry—a decision met with opposition from the victims' families, who wanted a full public inquiry into the cause of the incident as well as a determination of who was responsible. However, government officials said they were unwilling to undertake a public inquiry so soon after the Paddington rail crash on October 5, 1999, as Lord Cullen had undertaken a full review (Cullen, 2001a, 2001b; Cullen and Uff, 2001).

A number of charges were brought in relation to the incident. July 9, 2003, the Crown Prosecution Service (CPS) announced that six individuals had been charged with the manslaughter of the four victims who died as a result of the Hatfield incident and with additional breaches of provisions under Section 3(1) and contrary to Sections 33(1) and 37 of the HSWA (HSE, 1974; Independent Investigation Board, 2006). Consequently, a further six people were served with summons under the HSWA. In addition, manslaughter charges and breaches of the HSWA were served on Network Rail (formerly Railtrack plc) as the infrastructure controller, and Balfour Beatty Rail Infrastructure Services Ltd (formerly Balfour Beatty Maintenance Ltd), as the maintenance contractor (Independent Investigation Board, 2006). None of the manslaughter charges was upheld in court, and no individuals were found guilty of any charge. However, July 18, 2005, Balfour Beatty pleaded guilty to a health and safety charge relating to the derailment, and on September 6, 2005, Network Rail (Railtrack) was found guilty of health and safety charges. Balfour Beatty was fined £10 million, although this was later reduced at appeal to £7.5 million, and Network Rail (Railtrack) was fined £3.5 million. In addition, each company was ordered to pay £300,000 in prosecution costs. Prior to the Hatfield incident, the largest fine imposed in the English Courts for breaches of health and safety on the railway was £2 million, a fine levied on Thames Trains following the Paddington rail crash (*ibid.*).

Selby

The Selby rail crash, also known as the Great Heck rail incident, was a high-speed train accident that happened at Great Heck near Selby (ORR, n.d.-b). This crash occurred under the regional jurisdiction of North Yorkshire Police on the morning of February 28, 2001, during the hours of darkness and at temperatures just above freezing and with intermittent sleet showers (HSE, 2001). A total of 6 passengers and 4 railway staff were killed; 82 people were injured. The crash occurred at approximately 6:13 a.m., when a Land Rover (heavily loaded with a trailer carrying another vehicle) swerved off

* PLC = Public Limited Company.



Figure 13.4 Selby train crash. (Photo courtesy of Richard Crampton/Rex Features.)

the M62 motorway just before a bridge over the East Coast Main line. The vehicle traveled down an embankment and came to rest on the southbound railway track. The driver, Gary Hart, tried unsuccessfully to reverse the car off the track. At 6:21 a.m., as Hart was using a mobile telephone to call the emergency services, the Land Rover was hit at over 120 mph by a southbound Great North Eastern Railway (Figure 13.4) intercity service heading from Newcastle to London King's Cross.

The leading driving van of the GNER intercity derailed on impact, but the train stayed upright until it hit a set of points at a nearby siding, which in turn deflected it into the path of an oncoming freight train traveling from Immingham to Ferrybridge, approximately half a mile from the impact site with the Land Rover. Stephen Dunn, the driver of the freight train, was killed. Of those traveling on the passenger train, three train staff were killed (John Weddle the driver; Raymond Robson, a train guard; and Paul Taylor, a chef), as were six passengers. Survivors of the accident included Andrew Hill, a train-driving instructor with 24 years of experience who was traveling in the cab and teaching a new route to Dunn.

Immediately prior to impact, the speed of the intercity was estimated to be approximately 88 mph and the freight train around 54 mph. With a consequential combined collision speed of 142 mph, the collision between the trains is the highest speed railway incident to have occurred in the United Kingdom. The speed and weight of the trains combined to produce an estimated impact force of over 900 megajoules of energy. The collision left both

trains extensively damaged and derailed, with wreckage spread over a large area blocking both railway lines and causing significant damage to the railway infrastructure (HSE, 2001). Interestingly, the intercity passenger train was also involved in the Hatfield rail crash some months earlier but had escaped that incident with only slight damage. The freight train haulage carriage was written off as a result of this accident, despite being only a few months old.

This was a complex deployment as the initial accident occurred on a stretch of the M62 motorway that was covered by the traffic department of Humberside Police, which investigated the road accident, even though it was geographically located in an area under the control of North Yorkshire Police. Victim recovery officers were provided by South Yorkshire and Metropolitan Police Services, and Detective Chief Superintendent Graham Sunderland from West Yorkshire Police acted as senior identification manager (SIM). Finally, the incident on the railway was within British Transport Police's jurisdictional control, as a consequence of which they took primacy, and the Health and Safety Executive also initiated an investigation as the deaths had occurred place in the workplace.

Hart, the driver of the car, was not injured in the collision. Initially, he claimed that his car had suffered a mechanical fault or had collided with an object on the road. Humberside Police recovered the vehicle and conducted a reconstruction of the Land Rover, in the presence of 34 other parties with a vested interest in the outcome, including insurance companies, shock absorber and tire manufacturers, Rail Track, and Land Rover. All were interested in discovering why the vehicle had left the road and how the accident occurred. The number of agencies involved in an accident such as this demonstrates not only the potential complexity of the search and recovery operation but also the complexity of the investigation as a whole. Following the full reconstruction of the vehicle and events, an investigation concluded that the Land Rover was not defective and that Hart had been driving in a sleep-deprived condition after staying up late the night before and thus had not applied the brakes as the car went down the embankment. December 13, 2001, at Leeds Crown Court, Hart was found guilty of 10 counts of causing death by dangerous driving and was sentenced to 5 years' imprisonment (HSE, 2001). He was released for cooperation after serving 2 1/2 years.

An investigation into the incident was undertaken by the HSE (2001), and a report was produced detailing its findings and suggestions for improved safety. It found that the derailment of the passenger train and the subsequent collision with the freight train and the deaths and injuries caused were the result of the Land Rover obstructing the railway line (*ibid.*, p. 36). Within the general review of the incident, the report also noted that the emergency services managed the incident with a high level of efficiency and effectiveness (*ibid.*, p. 7) in what was recognized as a large-scale and series incident at a relatively remote location.



Figure 13.5 The crashed train next to a sign reading, “Welcome to Potters Bar.” (Photo courtesy of Nils Jorgensen/Rex Features.)

Potters Bar

May 10, 2002, a West Anglia Great Northern train bound for King’s Lynn in Norfolk via Cambridge left King’s Cross station at 12:45 p.m. Minutes later, at 12:55 p.m., just south of Potters Bar railway station (Figure 13.5) and while traveling at a speed of 97 mph, the four-carriage train passed over a set of points (HSE, n.d.-a) that failed on contact. This failure caused the rear wheels of the carriage to go onto the adjacent line and then to derail. The derailed coach became detached and slewed sideways and slid along the rail. The carriage was then launched into the air, passed over a bridge, and came to a rest under a platform canopy abridging adjacent platforms, ending at an acute angle wedged sideways on the platform underneath a now extremely warped canopy (ORR, 2009a). One portion of the carriage hit a bridge, which resulted in debris from the damaged bridge falling into the road below (Darkes Lane). The front three carriages stayed upright and stopped north of the station. Seven people died, six of whom were train passengers; the seventh was killed by debris that fell into Darkes Lane. In addition, 76 were injured as a result of this incident (HSE, 2002; ORR, 2009a). Again, HC was the responding force.

Following the incident, two criminal investigations have been in progress: one by the BTP into possible manslaughter offenses, and the other by HSE into possible offences under the HSWA (HSE, 1974). Although the two investigations do overlap, the BTP investigation takes primacy, and HSE’s work has largely been in support of the police investigation. The HSE was directed

to undertake an investigation by the Health and Safety Commission, under the oversight of the investigation board, which includes members independent of the HSE. The HSC required the board to make recommendations regarding ways rail safety could be improved. The board has no role in relation to the BTP investigation (HSE, n.d.-a).

The Health and Safety Executive (HSE, n.d.-b) consequently published three interim reports in relation to the accident. It has yet to be decided if a final report will be published by the Office of Rail Regulation, after all investigations are concluded. The ORR became responsible for the investigation board in April 2006 when it took over from HSE as the health and safety regulator for the rail industry. The ORR publishes its own manual titled the “Significant Incident Procedures Manual” (ORR, 2009b), which aims to give guidance to any staff members who may become involved in any significant event on the railways.

On October 17, 2005, the Crown Prosecution Service (CPS) announced that there was no realistic prospect of conviction in relation to the Potters Bar train derailment. Following the derailment at Grayrigg, Cumbria, on February 23, 2007, the inquest into the deaths of those who died at Potters Bar remained adjourned pending the secretary of state for transport’s decision as to whether an inquest was the appropriate way forward. June 19, 2009, the secretary of state announced that he felt separate inquests into both incidents were appropriate and that the dates for the inquests would be determined by the relevant coroners in due course; he also added that he did not intend to convene a public inquiry into the rail accidents at Grayrigg or Potters Bar, either individually or jointly (ORR, 2009a).

ORR’s investigation into the derailment remains “open” until after completion of the coroner’s inquest, after which the ORR will consider whether proceedings under the HSWA are appropriate (HSE, 1974). Although not ideal for the bereaved families and victims, this is normal policy in accordance with the Work-Related Deaths Protocol (HSE, 2003) and recognizes the fact that additional information may come to light as a result of the inquest or that the coroner may decide to refer the case back to the CPS for further consideration of a manslaughter charge (ORR, 2009a).

Lessons Learned from These Incidents

Invariably, rail crashes are open incidents, as there is rarely a complete and reliable passenger manifest available. As a result, when the call comes to deploy, commanders organizing the response have no way of estimating how many individuals may be involved, injured, or deceased and therefore how many emergency response personnel to deploy. A number of factors must be considered as part of the response, many of which are the result of lessons

learned during previous deployments. Two elements affecting the deployment significantly are adverse weather conditions, hot or cold, and the location of the incident site. Some variables will be of significant importance in one event but will not affect any other deployment. For example, an unusual aspect of the emergency response to the Selby crash was the need to carry out disinfecting procedures at the scene due to the foot and mouth epidemic in the United Kingdom at the time of the incident, affecting access and egress at the site. Other factors can be planned for, as demonstrated by past deployments, and it is these that tend to be of importance in terms of mitigating against the occurrence of future events as well as improving future responses.

As part of rail incidents, a number of other investigations will commonly be taking place simultaneously, including an accident investigation, a criminal investigation, a health and safety investigation, and a victim recovery and identification operation. All agencies will be trying to produce a cohesive, transparent, and reliable explanation of the events over which they have jurisdiction. Due to the numerous agencies that become involved in rail accidents, emergency deployments are extremely complex; in addition, the geographical and physical conditions—such as having access and egress routes often located a considerable distance from a road or down an embankment—often add additional dangers and limitations. These problems can be managed, but it takes time to organize temporary roads to be built to facilitate easy access routes to a scene or temporary tents to arrive to cover areas of the incident site. Furthermore, debris—and therefore evidence—is often strewn over considerable distances. Finally, it is very difficult to control scenes in terms of secure access and affording appropriate dignity to the victims, through suitable media management and preventing inappropriate access to the public.

Following the Hatfield train incident, HC produced a report, the aim of which was to highlight interagency issues and areas of good practice in the response to the accident, as the HESMIC agencies are committed to the process of continued improvement to offer the highest response standard possible to all those affected by a major emergency in Hertfordshire. The report gave a number of recommendations for future deployments, including developing a common media response, improving communication among different police groups (e.g., the family liaison officers [FLOs] and the police communication officers), and improving provision for mutual aid (HC, 2001).

Typically, as in the cases covered in this chapter, first responders include the regional police force area, the BTP, the fire brigade, and ambulance service. All rail incidents are then investigated by the Health and Safety Executive, as it is responsible for investigating deaths in the workplace. In addition, the fire brigade and ambulance service may be coming from different geographical regions to assist with the rescue and treatment of survivors. Victim identification officers may attend from another force area, as part of mutual aid among

forces—as evidenced by the Selby incident. In the initial minutes and hours after an event occurs, any number of different agencies will be involved with the rescue and recovery operation, potentially with the addition of members of the public. Only once the initial chaotic scene has been brought under control can the body and evidential recovery phase begin.

Since these events are relatively rare, in terms of occurrence per force area, they consequently are often used as “training exercises”; although officers may be well trained, few if any of the officers assigned to the victim recovery teams have deployed to rail crashes previously. This has led to less than optimal recoveries taking place as officers “learn on the job.” However, in events such as those described, one of the core trends is one of teamwork and interagency cooperation. This can be challenging when so many agencies are involved, particularly as, until relatively recently, the groups previously did not undertake joint training exercises. As a result, the teams were not fully aware of the other responders’ requirements. This situation has now been rectified, with the development of a national, centrally trained disaster victim identification cohort.

References

- Cullen, W. D. (2001a). Office of Rail Regulation: The Ladbroke Grove Rail Inquiry, Part 1 report. Available from <http://www.rail-reg.gov.uk/upload/pdf/incident-ladbrokegrove-lgri1-optim.pdf> (accessed April 29, 2010).
- Cullen, W. D. (2001b). Office of Rail Regulation: The Ladbroke Grove Rail Inquiry, Part 2 report. Available from <http://www.rail-reg.gov.uk/upload/pdf/incident-ladbrokegrove-lgri2-optim.pdf> (accessed April 29, 2010).
- Cullen, W. D. & Uff, J. (2001). The Office of Rail Regulation: The Southall and Ladbroke Grove Joint Inquiry into Train Protection Systems. Available from <http://www.rail-reg.gov.uk/upload/pdf/incident-ladbrokegrove-jointinquiry.pdf> (accessed April 29, 2010).
- Hertfordshire Constabulary. (HC). (1997). The Watford Rail Incident Inter-Agency De-Briefing Report. Available from http://www.herts.police.uk/FOI/Significant_Information/r_Watford%20rail_%20crash-%20REDACTED.pdf (accessed April 29, 2010).
- Hertfordshire Constabulary. (HC). (2001). HESMIC Inter-Agency De-Briefing Report: The Hatfield Train Incident 17th October 2000. Available from http://www.herts.police.uk/FOI/Significant_Information/r_Information/r_Hatfield-derailment-report-%20REDACTED.pdf (accessed April 29, 2010).
- Health and Safety Executive. (HSE). (1974). HSE Health and Safety at Work Etc. Act 1974 (Application Outside of Great Britain) Order 2001. Available from <http://www.uk-legislation.hmso.gov.uk/si/si2001/20012127.htm> (accessed April 29, 2010).
- Health and Safety Executive. (HSE). (2000). Health and Safety Executive: The Train Collision at Ladbroke Grove 5 October 1999—A report of the HSE Investigation. Available from http://www.railwaysarchive.co.uk/documents/HSE_Lad_Rep001.pdf (accessed April 29, 2010).

- Health and Safety Executive. (HSE). (2001). Health and Safety Executive: The Track Obstruction by a Road Vehicle and Subsequent Train Collisions at Great Heck 28 February 2001—A Report of the Health and Safety Executive. Available from <http://www.rail-reg.gov.uk/upload/pdf/incident-greatcheckfinal-optim.pdf> (accessed April 29, 2010).
- Health and Safety Executive. (HSE). (2002). Health and Safety Executive: Train Derailment at Potters Bar 10 May 2002—HSE Interim Report—14 May 2002. Available from <http://www.rail-reg.gov.uk/upload/pdf/incident-pottersbar-interim.pdf> (accessed February 11, 2010).
- Health and Safety Executive. (HSE). (2003). Health and Safety Executive—Work-Related Deaths: A Protocol for Liaison. Available from <http://www.hse.gov.uk/pubns/misc491.pdf> (accessed April 30, 2010).
- Health and Safety Executive. (HSE). (n.d.-a). Health and Safety Executive—Potters Bar Investigation: HSE Issues Latest Progress Report. Available from <http://www.hse.gov.uk/press/2003/e03087.htm> (accessed April 29, 2010).
- Health and Safety Executive. (HSE). (n.d.-b). Health and Safety Executive Homepage. Available from www.hse.gov.uk (accessed April 29, 2010).
- Independent Investigation Board. (2006). The Train Derailment at Hatfield: A Final Report by the Independent Investigation Board. Available from <http://www.rail-reg.gov.uk/upload/pdf/297.pdf> (accessed April 29, 2010).
- Jack, I. (2001). *The Crash that Stopped Britain*. London: Granta Books.
- Office of Rail Regulation. (ORR). (2009a). The Office of Rail Regulation: Potters Bar. Available from <http://www.rail-reg.gov.uk/server/show/nav.1205> (accessed April 29, 2010).
- Office of Rail Regulation. (ORR). (2009b). Office of Rail Regulation: Significant Incident Procedures Manual (revised December 2009). Available from <http://www.rail-reg.gov.uk/upload/pdf/sipm-web.pdf> (accessed April 29, 2010).
- Office of Rail Regulation. (ORR). (n.d.-a). Office of Rail Regulation Homepage. Available from <http://www.rail-reg.gov.uk/> (accessed April 29, 2010).
- Office of Rail Regulation. (ORR). (n.d.-b). Office of Rail Regulation: Great Heck—Selby. Available from <http://www.rail-reg.gov.uk/server/show/nav.1202> (accessed April 29, 2010).
- Office of Rail Regulation. (ORR). (n.d.-c). Office of Rail Regulation: Hatfield Train Derailment. Available from <http://www.rail-reg.gov.uk/server/show/nav.1203> (accessed April 29, 2010).
- Office of Rail Regulation. (ORR). (n.d.-d). Office of Rail Regulation: Ladbroke Grove. Available from <http://www.rail-reg.gov.uk/server/show/nav.1204> (accessed April 29, 2010).

Chinese Lorry Deaths, Dover, June 18, 2000

14

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Introduction

On Sunday, June 18, 2000, 58 illegal Chinese migrants were discovered dead in the back of a refrigerated truck that had just arrived at the port of Dover—all were victims of human trafficking. Two males survived the journey but were of limited assistance to the investigation in terms of identifying the deceased. Kent Police (Figure 14.1) was the responding force, and numerous officers were involved in the complex investigation of the incident, that spanned three continents and required new processes to be developed and intergovernmental and bicultural relationships to be forged.

Background

The immigrants had initially traveled in smaller groups from their homes in the mountainous Fujian Province in China, in preparation for their journey to the United Kingdom. Their routes involved leaving China with personal documentation and entering Europe via Yugoslavia or Russia, where their passports had been removed by their traffickers, or “snakeheads.” The 60 Chinese migrants—the 58 that perished and 2 survivors—had been assembled by their handlers at a warehouse in the Dutch port of Rotterdam. It was within this huge complex of interconnecting docks, warehouses, and container storage areas that the migrants had been taken in vans and, due to the activity so usual to this area, their movements had gone unnoticed.



Figure 14.1 Policing regions of England with Kent Police boundaries highlighted.

At Rotterdam they were put into an articulated trailer container with little provision for water, and the trailer was part loaded with boxes of tomatoes to conceal the clandestine load. They were told that just prior to the ferry crossing a small hatch situated at the front of the container would be closed so that noise from within the unit would not be heard by other ferry passengers or the ship's crew. The truck driver, Perry Wacker, then drove the truck to Zeebrugge for the ferry crossing to Dover, and, as the occupants had been told, he had closed the hatch. As this was an old refrigerated unit of solid insulated construction, once the back doors were secured with their substantial locking bars the hatch constituted the sole source of air into the container.

The journey had cost each of the victims and their families \$30,000 (approximately £18,000) for the chance to make a new life in the United Kingdom and to follow the dream of a Chinese proverb that states, "After one relative sneaks across the water, the entire family gets rich." In fact, the

cost to both victims and families was considerably higher than the monetary fee. They endured a long and arduous journey across Asia and Europe, using a variety of transportation, staying in “safe houses” and, at times, using false Korean passports, until they were eventually taken to the Rotterdam warehouse where they were loaded into the old refrigerated unit that customs officers would later stop at Dover.

Circumstances

According to Home Office statistics, the United Kingdom realized its highest ever number of asylum applicants in September 1999 when 7,355 applications were made; this was an increase of 2,500 monthly applications since April 1999. The Office of National Statistics shows escalating numbers of Chinese migrants from May 1999 (195 applicants) to a significant peak of 575 a year later, an increase of approximately 195% in just 12 months. It is against this backdrop that, close to midnight on Sunday, June 18, 2000, Customs and Excise officers at Dover’s Eastern Docks in Kent stopped a Dutch-registered articulated lorry, comprising a tractor unit and an aging refrigerated trailer. The truck had just traveled on a P&O ferry, the *European Pathway*, from Zeebrugge, driven by 33-year-old Dutch national Wacker.

At 11:35 p.m. customs officials in Dover, alerted by inconsistencies in documentation, stopped the vehicle and on inspection discovered that the seal on the rear doors of the refrigerated container had been cut. This was a recognized method of people smuggling, and they immediately alerted the officers to the potential cargo of the trailer. The rear doors of the truck container were opened, and instead of the expected stream of cold air, the team members felt what they were to later describe as “very warm air.” Immediately, the officers were confronted with two Asian males close to the rear doors, both of whom were dressed only in underwear and were close to death. Pallets of tomatoes at the rear of the trailer were unloaded, and the officers were able to view the rest of the vehicle’s human consignment, a group of unknown, motionless individuals also stripped to their underwear. Following further assessment it was determined that the unit contained a total of 58 deceased individuals of probable Chinese descent, 54 of whom were male and 4 female. Wacker was arrested on suspicion of manslaughter and subsequently explained to police officers that he was an unemployed truck driver and had been approached by two men and asked to drive a truck to England. He claimed that the truck had been sealed including the vents which would have provided fresh air, in Rotterdam and that he was unaware of the human cargo—although the investigation later proved that he had full knowledge of his consignment (Figure 14.2).

The two survivors were interviewed by detectives but were able to give only very limited information regarding their journey and the potential

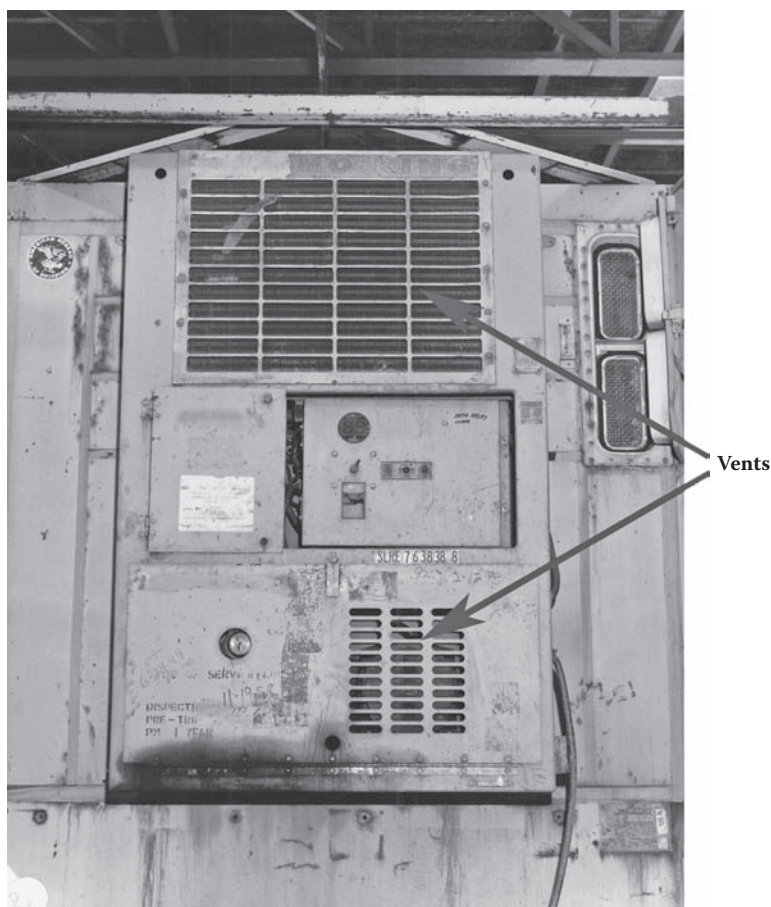


Figure 14.2 Front of trailer showing the vents. (Photo courtesy of Kent Police.)

identities of their fellow passengers. Scenes of crime officers (SOCOs; sometimes also called crime scene investigators, or CSIs) attended at Dover docks, by which time the victims were certified as being deceased. All victims were videotaped and photographed *in situ* before being removed from the container unit (Figure 14.3) and placed alongside the vehicle in the loading bay in which the vehicle had been stopped (Figure 14.4). The victims were intact, and it was immediately apparent that the cause of death was something other than violence. A decision was made to give the victims a unique reference number (URN) and to simply number the deceased 1–58, although the exact number of deceased was not known at the beginning of the process. These numbers were used for the deceased throughout the inquiry and were a simple and effective identification of each victim until they were formally identified.

This disaster evidenced a large number of differences to previous mass fatality incidents (MFIs), as a consequence of the circumstances in which the



Figure 14.3 Photograph of the inside of the container unit. This photograph was taken following removal of the victims and various items of clothing but shows the pallets and tomatoes *in situ*. (Photo courtesy of Kent Police.)

Chinese immigrants had been found in the truck. For example, this was an open incident, with no initial evidence with which to begin building potential identifications as none of the victims had official travel documents; even if they had, the circumstances of the victims' entry into the United Kingdom would almost certainly result in them having counterfeit documentation. In addition, to avoid attracting attention by carrying baggage, the migrants had worn as much of their personal clothing as had been practicable and had begun the trip from Rotterdam wearing multiple layers. As the temperature had risen inside the container after it had been sealed, the migrants had undressed. Each victim discarded numerous items of clothing; thus, a useful source of intelligence was lost as the clothing could not be attributed to any one victim. Furthermore, families had not seen the victims for at least 10 days and would not necessarily be expecting to have any contact for some time; consequently, missing persons' reports were unlikely to be of assistance at this stage.

An additional considerable obstacle for the investigative teams to overcome was the fact that the victims were from Asia, and thus it would be difficult to generate the required levels of media coverage to bring the event to the notice of the friends and families of the victims in their home country to gain the valuable identification information. Fujian Province has a



Figure 14.4 Early work by scenes of crime officers into the examination of the lorry's container unit and its contents. The loading depot at Dover Eastern Docks where Wacker had been initially directed provided the environment for controlled evidence collection activity. (Photo courtesy of Kent Police.)

population of over 35 million, and outside of the major cities finance is provided from farming rice, sweet potatoes, and wheat. Living standards are low in these areas, and the availability of modern communication media is greatly reduced. Fujian is one of the most linguistically diverse regions in China although the official language is Mandarin. This lack of information was compounded by the nature of entry to the United Kingdom, as families were reluctant to come forward as they would fear shame and reprisals for their family member's actions.

This situation resulted in some significant problems for Kent Police, and decisions needed to be made immediately as to how best to move the investigation forward in terms of identifying the victims, as well as determining who was ultimately responsible for their deaths. As with many incidents, there was no advanced warning that it was about to take place, and this matter had, at the time this incident occurred, to be dealt with using existing staff, facilities, and equipment while still dealing with existing and new crime cases. A senior detective was appointed as a senior identification manager (SIM), despite the disaster taking place nine months before Lord Justice Clarke (2001a) advocated the role during his inquiry into the *Marchioness* disaster and Lord William Douglas Cullen carried out the inquiry into the

Ladbroke Grove disaster (Cullen, 2001; Cullen and Uff, 2001). A small casualty bureau had opened at 7:30 a.m. on Monday, June 19, and closed at 6:00 p.m. on Wednesday, June 21. Initially, as predicted, some difficulties were experienced making the bureau of sufficiently high profile that it would be given appropriate publicity to assist in the antemortem (AM) data harvest, although there was extensive UK press interest in the events unfolding in Dover docks.

Recovery and Identification

The scene itself was treated as a homicide crime scene by crime scene managers (CSMs). The victims were recovered by crime scene investigators well versed in recovering murder and suicide victims but who were not specifically DVI (disaster victim identification) recovery trained and had no awareness of specific DVI body labeling or recovery processes. As a result, the removal of the victims was very thorough from the process of continuity and investigation point of view, but no Association of Chief Police Officers (ACPO) body labels were used—only cardboard exhibit labels on the wrist and toe giving the 1–58 numerical identifier. Despite these shortcomings, the accuracy of the criminal investigation was more than sufficient for the needs of the DVI aspect of the incident providing detectives with significant and useful data.

It was, however, immediately recognized that some factors assisted the inquiry, and the police made full use of them. Cold storage was temporarily available close by in the form of a storage area for fresh produce passing through the port of Dover; although the latter caused significant difficulties from a resanitation for reversion to previous use, this was used in the short term until something more permanent could be arranged. It was also fortunate that the deceased were not disrupted or decomposing, as this further assisted the investigators in the early stages, thereby simplifying the process. In addition, the deceased were all located within the container, which meant that the scene was relatively easy to control: It was within a secure dock area with limited access and reasonably easy to protect from the press and passers-by and was undercover.

Unfortunately, however, there remained no indication of who the victims were, where they had come from, where they were going to, or why they were dead inside a Dutch container in Dover docks. The movement of illegal immigrants into the United Kingdom was by no means a new phenomenon and, due to the often hazardous methods to which migrants resort, their deaths are not uncommon either. In addition, illegal entry into the United Kingdom via the Port of Dover was a common occurrence, and experience told the officers that, given the circumstances of the incident, the challenge was going to be sourcing appropriate AM information for comparison. Once

the ethnic origin of the victims was known, a theory emerged quite early on that they were possibly Chinese citizens attempting to gain illegal entry into the United Kingdom; this was ultimately proven, as was Wacker's full knowledge of their presence within the container. In addition, it was recognized that this was not simply an accident but was a criminal investigation and that the two inquiries would have to be run in parallel and would take a significant amount of time.

One of the difficulties faced, when few facts are known for certain, is that of creating an effective forensic strategy. An appropriate approach was determined for this incident, but any strategy must be dynamic and capable of being modified to suit additional information. This proved to be necessary in this case in relation to the mortuary procedures. There is, within the United Kingdom, no permanent mortuary facility capable of dealing with large numbers of disaster victims. Even a relatively low number of victims, such as in this case, cannot always be catered for. It was clear that in this particular case, given that the victims were all apparently of Asian origin, it might be a considerable length of time before they could all be identified and repatriated.

Urgent decisions therefore needed to be made with regard to the best and most appropriate way to conduct postmortem (PM) examinations of the victims. Following discussions with all of the relevant investigative parties, the decision was made to use an existing hospital mortuary with storage off site. In June 2000 the arrangements with the local authority were to build a mortuary within 24–36 hours postincident on Ministry of Defence (MOD) property, but using an existing mortuary was favored by both the police and forensic management to progress the PM activity at the earliest opportunity in familiar surroundings. The fact that the mortuary selected at William Harvey Hospital was already known to the teams was a significant advantage as all of the staff working on the incident knew one another and were experienced not only in working together but also operating in those particular premises. Its proximity to the M20 motorway also significantly eased the transportation of the deceased, and local undertakers were employed to transport victims to and from the docks.

Two pathologists were used, and teams were put together to assist them. Each team consisted of one SOCO who took the necessary photographs and acted as quality assurance and liaison between teams and the identification commission and criminal inquiry teams; two additional SOCOs; one anatomical pathology technologist (APT); two SOCO exhibits officers; and one police officer who had accompanied the deceased from the docks for continuity purposes and who would accompany them back to the docks at the end of the examination. This police officer also completed the pink (PM) Interpol DVI records as directed by the pathologist. In addition, fingerprint teams took PM prints once the pathologist had examined the deceased. A detective inspector (DI) was tasked with the role of mortuary manager, and this was

found to be very effective despite this being an unfamiliar role both to him and to the teams working within the mortuary. His presence took most of the organizational burden from the mortuary teams who were able to concentrate more fully on their own roles and responsibilities. Over the next three days the 58 victims were all examined, and in each case the cause of death was given as irreversible cerebral anoxia. A second PM was performed on each victim at the request of Wacker's legal defense team, which resulted in some additional identification marks being located on the bodies.

Early in the strip and search process it had become apparent that many of the victims had concealed handwritten numbers on and in clothing and personal property. These were recorded on the Interpol form and photographed (Figure 14.5). Similar numbers were recorded within the other unattributable personal property, and, in total, over 400 numbers were found. These numbers were so well concealed that a decision had to be made as to how exactly to search for them, so as the PMs continued, clothing was examined as it was removed. Nevertheless, it was obvious that a more detailed examination of the clothing would be required by a dedicated team at a separate location in the future. This additional search involved the unpicking of every seam of the clothing; numbers, photographs, and money were found hidden inside pockets, shirt seams, trouser flies, hems, and turn-ups, belts, and even inside labels. These numbers were later identified as relating to UK telephone contacts for advice and assistance later in their journey. A total of 27 victims



Figure 14.5 A series of numbers written in ink can clearly be seen on this pair of socks. (Photo courtesy of Kent Police.)

were carrying the same telephone number; a fact that would greatly assist the criminal investigation at a later stage.

It was fortunate that the local coroner, Richard Sturt, was very experienced, having already had involvement in the capsizing of the roll-on-roll-off passenger ferry *Herald of Free Enterprise* off the Belgium coast, which occurred March 6, 1987, and resulted in the loss of 193 people (MAIB, n.d.). He designated the identification criteria for the deceased to be any one of the primary identifiers (DNA, fingerprints, odontology, or unique medical condition), plus as many of the secondary or supporting identifiers as was practicable. Alternatively, given the unique circumstances, he would consider a combination of secondary and supporting identifiers. The use of odontology was considered, but it was decided that this was not a viable option due to the lack of the victims' AM dental records—a factor that created practical problems.

Storage facilities were sought, which would need to be available on a long-term basis, as the investigation was likely to be protracted. The only storage facilities at the docks were short-term; consequently, alternative, longer term storage was achieved by relocating the victims to a refrigerated container on MOD property, affording security and privacy. It was ironic that, having died in a container, the deceased were being stored in another, but given the limited suitable options this was the most appropriate location. Prior to taking receipt of the deceased, the container was cleaned to ensure that it was sterile and was racked to allow appropriate storage for the victims (Figure 14.6). A plan was formulated for this unit detailing the location of each of the 58 victims to allow an efficient and effective system for the removal of victims for identification and defense PM removal, and this proved to be very successful.



Figure 14.6 The freezer unit fitted with steel tracking to store the 58 deceased. (Photo courtesy of Kent Police.)

The reconciliation unit commenced matching procedures on Thursday, June 22. With the limited information available from the casualty bureau, there was only the Interpol DVI forms, photographs of the deceased, and unattributable property from which to develop potential identifications. The senior identification manager set tactical parameters around longterm storage; sourcing and collation of identification information; a searchable computer database; understanding of Chinese culture; identification procedures; and international and other interested party liaison. A simple spreadsheet was developed to enable fast searching across subject headings, to provide an audit trail on the identification progress of each victim, and to assist with difficulty in spelling and searching name variations.

At this early stage the family liaison issues needed careful consideration. Assistance in understanding cultural diversity, bereavement, and family support was sought from a variety of sources including the UK Chinese communities, Westminster City Council Chinese Victim Support, and the Metropolitan Police Service Chinatown Unit. Wherever possible the reconciliation unit provided the appropriate level of response to families to prevent any insensitivities but also to empathize with the anxieties of approaching the police because of fear and shame. A revised and translated Home Office homicide pack for bereaved families was produced, preempting recommendation 31 of Lord Justice Clarke's (2001b) report (p. 158).

A direct and confidential telephone number was advertised extensively through community groups for family members in Fujian Province to contact either Kent Police or other agency partners. However, many families sought to deny involvement for fear of victimization from the snakehead facilitators and the Chinese authorities. After relationships and avenues of communication were developed with the relevant Chinese authorities, a slow exchange of information began that enabled the comparison of passport applications originating from Fujian Province to the photographs of the deceased. To achieve this, the UK police had to send copies of the PM images to the Chinese authorities, with written assurances given on their use. Information relating to the deceased was limited, and it was realized that liaison with the Chinese authorities was going to be required to assist in identifying the victims due to the rural nature of the area from which they had originated and the general lack of communication systems. Therefore, the UK media were used as an additional mechanism of engagement. This, together with the media's agreement to act as intermediaries, provided information for some missing persons. As a result, journalists reported with video and still images from Fujian of possible bereaved families with photographs of their loved ones.

With very few descriptive details of the deceased, a Microsoft PowerPoint presentation was designed to aid the preliminary identification of the deceased if family members came forward, prior to obtaining confirmatory

scientific samples and allowing viewing of the deceased. Some friends and family members of the victims were already based in the United Kingdom and thus were a source of AM information. Before they were allowed to view the presentation, however, their UK immigration status had to be confirmed as a requirement of Her Majesty's (HM) Immigration Service. When a potential next of kin came forward, an agreement had been reached that the Chinese authorities would approach the family in Fujian, show the photographs of the deceased, record a statement, and ascertain a family structure for future DNA sampling. A structured DNA testing strategy was produced for the Chinese authorities, which would facilitate an AM and PM match. This procedure was based on DNA sampling categorized into levels of priority for sample collection: The first choice was the potential victim's maternal and paternal DNA for comparison, the second choice was one parent and a sibling; third choice was multiple sibling samples where no parental DNA was available; and, fourth, where no immediate family was available for testing, the mother's closest blood relative would be sampled. By early September blood samples had been provided with passport photographs for all but two of the deceased and resulted in the identification of 50 of the 58 victims, equating to approximately 86%.

The wide spectrum of identification parameters was important, given that it was not possible to use primary identification for all 58 victims. While DNA established the identities of 50 victims, the availability of blood samples from parents of those individuals who remained unidentified was hindered as the average life expectancy in Fujian Province is 70 years for males and 75 for females (China Statistical Yearbook, 2005). In terms of alternate primary identifiers, odontological assessment would be of little value in this incident as the victims had poor dentition indicating limited, if any, dental treatment. Furthermore, of those showing evidence of treatment, it was suggested that in all probability this had been sourced outside China, and consequently no records would be available for comparison to the PM dental charts. Fingerprint identification proved important for two victims. The first was identified by a fingerprint impression in Hong Kong following a conviction in 1997 and was subsequently fingerprinted on four separate occasions while in Europe, giving different identities. The other victim identified through fingerprint comparison had been detained (not convicted) on six separate occasions for illegal entry in Germany, providing a total of six separate identities. While the PM fingerprints confirmed it was the same person, the coroner would not accept identification on this basis. Additional information was used wherever possible to confirm further the identities of the deceased. Facial mapping work was carried out as supporting identification and used in 37 cases and several others where it was considered "likely but not confirmed." The coroner accepted the identification of all of the victims at the inquests.

Following acceptance of identification, the issue of repatriation took an additional 4 months because of the complexity in the necessary agreed arrangements by all agencies and governments involved. In the interim, various final arrangements were considered before agreement was reached, with the UK government agreeing to fund the repatriation as a humanitarian gesture. The final embalming and encoffining were witnessed by officials from Fujian and Kent Police before the victims were repatriated January 19, 2001, from London Stansted Airport.

After the Event

At the subsequent trial at Maidstone Crown Court April 5, 2001, Justice Alan Moses sentenced Wacker to 14 years imprisonment for the manslaughter of the 58 victims and for his part in their facilitation of illegal entrance to the United Kingdom. The numbers sewn into the clothes of the immigrants proved pivotal in the criminal investigation, as 27 victims had the same number that would, within days of the incident occurring, lead to the arrest and subsequent conviction of Ying Guo, a Chinese migrant interpreter for facilitation offenses. As a result, Guo was sentenced to 6 years in prison for conspiracy to facilitate human smuggling.

Any mass fatality event requires an efficient and coordinated response with little or no warning. Often this response must take into account not only its own objectives but also those of a criminal investigation, which is running in parallel, and this may in itself lead to some difficult conflicts. For example, processes and procedures must be followed appropriately so that evidence gained from them is robust while remembering the needs of the families who, regardless of the cause of the incident, urgently need answers and closure.

As a result of the incident, it can be concluded that Kent Police had some notable successes in the criminal aspect of the case and had learned some important DVI lessons in the process. In the absence of a national response or previous incident precedent at this time, there was a necessity to use existing staff and facilities. While it is true to say that this was effective in this particular case—since all victims were successfully identified and criminal convictions were brought—it pushed resources to their absolute limit.

In DVI inquiries the emotive nature of the work leads to additional pressures being brought to bear by governments and the media. These must all be taken into account and can have an adverse effect upon the performance, accuracy, and general welfare of staff involved in the process. In this incident the desire to complete the PM process quickly contributed to a failure to detail documentation completely, and the use of a forensic anthropologist may have provided greater detail regarding the origin of the deceased earlier in the

investigation. It should be noted that in this instance the victims were identified, showing that the applied system worked on this occasion. However, it is impossible to say if this would have been the case with more victims. Had the vehicle contained 80 victims, would the systems still have worked? Clearly there will come a point at which the incident simply becomes too large for a police force to manage singlehandedly, and the use of national resources, using UK DVI staff and custom-built facilities, will be the preferred option. At the time this incident occurred these options were unavailable.

With the benefit of hindsight it may have been better not to have used the cold storage area at the docks, and many might argue that the PM examinations should have been conducted in an emergency mortuary. Investigators are often faced with difficult and time-sensitive decisions and have to weigh the advantages and disadvantages of the various options. Many of these decisions can be debated in later analyses but must be made, and, whatever is decided, there will always be alternative points of view.

At the time of this disaster the role of the SIM was still under consideration and proved to be an effective way of coordinating the identification with a large criminal investigation covering three continents. As this particular incident occurred with the deceased originating from a different culture and political background, inevitable consequences in the disaster victim identification management contributed to the dichotomy of good practice and practical solutions. In this context this is just one issue. The relationship between the SIM, the senior investigating officer (SIO), and their experts is of paramount importance to the success or otherwise of the investigation and the DVI process. This relationship can, when required, give them the flexibility to “push” the boundaries of the incident, particularly in obtaining AM data when, as in this case, its collection proves to be problematic.

At the commencement of the identification and investigation process, it should be recognized that, for whatever reason, there may not be the full AM data to be matched against PM data, and some courageous decisions may need to be made to achieve the overall strategic aim of avoiding mistaken identification and incorrect repatriation. While these decisions may not necessarily appear to reflect good practice, the judgment based on reasoned, proportionate grounds will reflect more than just statutory influences, particularly where differences in culture, governments, and demographics exist. This effectively supports the notion that “when you’ve seen one disaster, you’ve seen one disaster.”

Despite the geographical distances involved, work with the families was very effective, and a key element of this was the deliberate emphasis that the reconciliation unit was independent of the police criminal investigation and would be able to deal with relatives’ information in the strictest of confidence. This was important given that the victims’ families felt a degree of shame and fear as to possible perceived repercussions from the British and

Chinese authorities and the facilitators of the human trafficking. Various strategies were employed, including the promotion of the unit's role as a focus for family liaison and identification with no obvious connection to the criminal investigation taking place in parallel.

Research undertaken by the Chinese police revealed numerous missing person forms in China, and work was undertaken on recent passport applications containing photographs. This gave investigators the ability to use facial mapping to assist the identification process, and the results of this work were later received by the identification commission and proved valuable in corroborating many of the positive results from the blood comparison work.

Despite the successes from both a criminal and DVI perspective, this incident highlighted some significant learning points. The cold storage area at the docks was actually for the purpose of keeping fresh produce in good condition when HM customs or other officials are inspecting freight vehicles. This area presented an ideal part of the victim recovery strategy and permission was granted for its use to act as a temporary victim holding area before more permanent facilities were organized. This did, however, present longer-term problems when the site reverted to its previous use. Despite receiving extensive cleaning when the victims had all been removed, yet, despite this, there were some ongoing health concerns and a stigma associated with the premises for some time afterward.

The examination of the victims' clothing was primarily carried out by officers unfamiliar dealing with incidents relating to the dead, and this process later caused some emotional difficulty for some of them despite the fact that they never came into contact with the victims themselves. This highlighted to Kent Police that there must be a robust selection procedure for staff used within the identification process, even if they are not directly concerned with the victims. This situation further served to illustrate the potential difficulties likely to be encountered where the number of victims exceeds the capacity of staff trained to deal with them.

Despite the success of the use of a mortuary manager, there were initially some difficulties with regard to specific roles and responsibilities because this was an unfamiliar situation for all concerned. Once clear areas of responsibility had been assigned, all ran very smoothly with the deceased all having been extensively examined within a 3-day period. The use of the Interpol victim identification forms was also problematic, and a number of victims had been examined before their use was fully understood and familiar to the mortuary teams. Training and the familiarity has, to a large extent, overcome this shortcoming, but it must be an ongoing process to ensure that this situation does not present itself again at a time of crisis.

The use of the William Harvey Hospital for the PM examinations was universally popular with the teams working within it but was less popular with those responsible for the transportation of the victims or indeed the

National Health Service (NHS). This has been a much debated issue, and there is little doubt that, in the absence of a funded, nationally operated, custom-built facility, a few more deceased would have made the use of an emergency mortuary a necessity.

DNA sampling also caused some problems, and numerous discussions took place between the Chinese authorities and the SIM as to the best method by which DNA samples could be taken from the victims' families. Cultural differences and a cautious approach between the parties presented some difficult challenges, which required great diplomacy to overcome. For example, the Chinese authorities would not consider taking buccal (cheek) swabs and did not find the prospect of taking blood in phials acceptable either. Nor would they allow any forensic staff from Kent into the country to assist in this process. The only option acceptable to both parties was for two certified blood samples to be taken on small circular filter papers, one of which one was to be sent back to the United Kingdom for comparison and the other to be retained in China. In addition, it was agreed that Kent Police would supply a certified sample of blood from each of the victims to China. Fortunately to facilitate this process, the Chinese police were able to indicate which members of the identified family police would be taking blood from, and an explanation was given to the families as to the way this would assist scientists in the United Kingdom to make a comparison. This ultimately proved to be a successful method of identification but was by no means a simple or straightforward process.

Publicity drives were employed to generate public interest, and Mandarin speakers were available to answer inquiries. Inevitably, though, this caused some significant problems, and in an ideal world more resources would have been available to handle the large numbers of inquiries and to translate the numerous pieces of information written in Chinese that this inquiry generated. The deceased were trying to gain illegal entry into a foreign country, and their families, although devastated, were somewhat fearful of the authorities. These factors compounded an already difficult situation. Consequently, family liaison was understandably very difficult given the complications of distance and the lack of available communications, although representatives of four families were located in the United Kingdom. Despite these difficulties, this incident was handled in a professional and efficient manner and as a result was brought to a successful conclusion both from a criminal and a DVI perspective. It is inevitable that there will be difficulties and hurdles to overcome, and these will always be a feature of an incident such as this. Specific disaster victim identification methods were, at this time, almost unknown in Kent, yet the case was successful because those engaged in the inquiry did their jobs with integrity, respect, and accuracy. They were also not afraid to push the limits of what should be possible.

References

- China Statistical Yearbook. (2005). China Statistics Press, Beijing Info Press. Available from <http://www.stats.gov.cn/tjs/ndsj/2005/indexeh.htm> (accessed February 3, 2011).
- Clarke (2001a). *Marchioness/Bowbelle*: Formal Investigation under the Merchant Shipping Act 1995. Available from <http://www.marchioness-bowbelle.org.uk/> (accessed February 5, 2009).
- Clarke (2001b). Public Inquiry into the Identification of Victims following Major Transport Accidents. Department of the Environment, Transport and the Regions.
- Cullen, W. D. (2001). Office of Rail Regulation: The Ladbroke Grove Rail Inquiry, Part 2 Report. Available from <http://www.rail-reg.gov.uk/upload/pdf/incident-ladbrokegrove-lgri2-optim.pdf> (accessed April 29, 2010).
- Cullen, W. D. & Uff, J. (2001). The Office of Rail Regulation: The Southall and Ladbroke Grove Joint Inquiry into Train Protection Systems. Available from <http://www.rail-reg.gov.uk/upload/pdf/incident-ladbrokegrove-jointinquirt.pdf> (accessed April 29, 2010).
- Marine Accident Investigation Branch. (MAIB). (n.d.). Herald of Free Enterprise. Available from: http://www.maib.gov.uk/publications_reports/herald_of_free_enterprise.cfm (accessed May 21, 2010).

Operation Lund— Morecambe Bay Cockling Disaster, February 5, 2004

15

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Introduction

Morecambe Bay is a large bay in the northwest of England, situated just south of the Lake District national park. It consists of a large expanse of sand and tidal mudflats and is the biggest of its type anywhere in the United Kingdom. Covering over 300 kilometers², with the cockle beds in some places stretching as far out as 7–8 miles from the shore, this area is notoriously treacherous, and when on the sands particular attention must be paid to the quicksand and the fast-moving tides, which can travel faster than a man can run. Add to this the 10-meter-high tide range together with the broad and shallow formation of the sands, and this deceptively calm and beautiful area can turn into a death trap within minutes.

Morecambe Bay is divided by two counties: Lancashire (Figure 15.1) on the south side of the Bay, and Cumbria on the north. This area of outstanding natural beauty is home to many species of wildlife, including the legendary Morecambe Bay Cockle. A tidal estuary, whose tributaries are the River Kent and the River Leven, Morecambe Bay is notorious for its tidal bores and shifting sands and is home to some of the finest cockle beds in the country. The trade is mainly carried out on the infamous and treacherous sands between Hest Bank on the Lancashire side of the bay and Flookburgh on the Cumbrian side. Now a public fishery, for centuries local fishermen have earned their living by harvesting shrimps and cockles from the bay during



Figure 15.1 Policing regions of England with Lancashire Constabulary boundaries highlighted.

the fishing seasons—the beds being opened only at certain times of the year to protect the stock levels and prevent overfishing. The cockle beds themselves are currently managed by the Environmental Agency and regulated by the Sea Fisheries Committee, which issue permits for this activity. Cockling is a bleak and arduous trade and is worth over £20 million a year to the shellfish industry, as the cockles are much admired and sought after by European restaurateurs. As a result, once harvested, the shellfish are dispatched abroad to Holland, Belgium, France, and Spain—countries that have overfished their own beds and must now look elsewhere for supplies.

Until Winter 2003, cockling in Morecambe Bay had been sporadic and dependent on the quality of the cockles available; however, this changed when good-quality cockle beds were discovered in two areas of the bay, namely, Bardsea in Cumbria and Bolton-le-Sands in Lancashire. The value of the cockles had previously been estimated to be in the region of £6,000,000, with each ton weight of cockles being worth up to £1,000. This new harvest,

however, was said to be worth up to £8,000,000 per annum and, once discovered, encouraged local fishermen to concentrate their efforts in preferentially cockling these regions whenever possible. As word spread, the local fishermen were joined in their efforts by other groups from all over Britain.

It is recognized that cockling is a lucrative business and that the rich pickings of Morecambe Bay have in recent years been exploited by middlemen from the Liverpool area who use foreign workers, mainly comprising gangs of Chinese workers, some of whom are illegal immigrants. The middlemen then pick up the freshly caught produce straight from the cocklers. The catch is driven to the coast, where it is taken by overnight ferry to the continent. Toward the end of 2003, locals began to notice gangs of Chinese nationals harvesting the beds; they appeared to be organized into large groups and were believed to be traveling to and from the Merseyside area on a daily basis.

Evidence suggests that soon after the newcomers' arrival, tensions arose between the locals and the organized gangs. Threats of violence and even incidents of diesel being poured over catches caused the Chinese groups to change their harvesting behavior; to avoid clashing with the locals, they accessed the sands only when the locals had left. Had the Chinese fishermen known that the locals, after years of experience of the tides and treachery of the bay, were leaving the area for safety reasons when the tide changed and made harvesting no longer safe, a major tragedy may have been avoided. With the tides predicted on the night of the disaster and with no way of seeing the tide coming in, anyone out in the bay at night stood little chance of survival.

Cockle picking in Morecambe Bay is primarily dependent upon three factors: the weather, the tides, and the fishing seasons. On Thursday, February 5, the day of the tragedy, the beds were open for licensed fishing. Earlier that day, a group of up to 38 Chinese cocklers was transported to the Warton Sands area, near Hest Bank, for the purpose of collecting cockles for gang master Lin Liang Ren. As the local fishermen headed shoreward that evening, the majority of the Chinese cocklers remained on the sands to continue their collection. These circumstances led to the deaths of 23 of these Chinese immigrant workers. A total of 21 bodies were recovered, all of whom had drowned; the final two missing victims' bodies have never been recovered. Lancashire Constabulary was the responding force, and the extensive disaster victim identification (DVI) procedure proved complex and time-consuming as a result of many of the victims being illegal immigrants. In total, 18 officers were involved with the identification inquiries, which took place across two continents.

Circumstances

On the evening of the tragedy, local fishermen were just finishing their cockling when they saw the familiar sight of minibuses loaded with Chinese workers



Figure 15.2 Chinese cocklers heading toward Morecambe Bay. (Photo courtesy of Peter Lomas/Rex Features.)

racing across the sands toward the cockle beds of Morecambe Bay. Due to transport difficulties traveling from their accommodation in Liverpool, the Chinese cocklers had arrived late at Hest Bank, a small village 2 miles north of Morecambe, Lancashire. Undeterred by poor weather, darkness, and a turning tide, they set about harvesting cockles to meet the demands of their employer and the lucrative seafood industry (Figure 15.2). This was their only source of income and was required to clear debts incurred during travel to the United Kingdom and to finance families left behind in China. Poorly equipped with no life-saving equipment such as immersion suits, buoyancy aids, flares, or beacons, they did not stand a chance of survival when the incoming tide cut them off from the shoreline over 2 miles away. Consequently, the 23 young, healthy Chinese immigrant workers remaining on the sands died in the cold water of the Irish Sea as it rapidly entered Morecambe Bay.

Her Majesty's (HM) Coast Guard Liverpool was notified of the unfolding events at 9:17 p.m. and in turn informed Lancashire Police, stating that a large group of cocklers had become trapped by the incoming tide in Morecambe Bay. An emergency call was made by one of the victims trapped out on the sands, trying desperately to summon assistance. However, the caller could not speak English and could only repeat the words "sinking water" to the operator. Another victim also made a telephone call from the sands to his wife in China to report that he was in "great danger."

A multiagency command structure was implemented, and the search and rescue (SAR) operation was coordinated by the coast guard. This commenced immediately and involved the Royal National Lifeboat Institute (RNLI), the Royal Air Force (RAF), Lancashire Ambulance Service, Lancashire Fire and Rescue Service, Lancashire police, and volunteers from local mountain

rescue teams. Cocklers who were working on or near the shoreline were able to scramble ashore as the water level rose. As the rescue operation progressed, 13 of these survivors were found on the shore at Hest Bank and other points along the coast and were taken to a reception center, in line with local authority emergency planning (Lancashire Resilience City Council). It is possible that other survivors made their way out of the area, avoiding the rescue services searching for them.

Victim Recovery and Identification

A number of calls were made to the coast guard and other emergency services during the night, but the full scale of the disaster was not realized until 3:28 a.m., Friday, February 6, when the RAF helicopter recovered the first body from the water. As the morning progressed, other people, including fishermen, joined the search. As the tide receded in the early hours it released more bodies, enabling the RNLI, coast guard, and local fishermen to recover them using hovercraft, quad bikes, and tractors. By 2:15 p.m., 19 bodies had been recovered. It was soon evident that all of the victims (17 males and 2 females) were of Chinese origin between the ages of 18–45 years. All of the bodies were conveyed to the mortuary at the Royal Lancashire Infirmary (RLI). On arrival at the mortuary in the opening hours of this incident, prior to the appointment of the senior identification manager (SIM) and against recognized victim recovery procedures, clothing was removed by police officers, and Association of Chief Police Officers (ACPO) victim labels were not completed.

On Sunday, February 15, another victim washed up on a sandbank in Morecambe Bay. Local police attended and recovered a partially decomposed female of Chinese origin. She was believed to be another victim of the incident that had taken place 10 days earlier. Finally, on Monday, May 3, 3 months after the original incident, the severely decomposed remains of a male were discovered on a beach at Bolton Holmes, close to where the original 19 victims had been located. Again, the local police attended, and the clothing and general appearance were such that they believed the victim to have been of Chinese origin. Both these individuals were recovered to RLI mortuary. The number of deceased now totaled 18 males and 3 females; no more victims were ever recovered.

This was an open incident, as there was initially no indication of who the victims may be. A full police investigation into the circumstances of the deaths commenced on Friday, February 6, 2004. At 8:30 a.m., almost 12 hours postincident, Gold Commander* Julia Hodgson formally declared

* Gold, strategic command; silver, tactical command; bronze, operational command.

this a major incident and called a meeting at which she appointed Detective Superintendent Michael Gradwell as senior investigating officer (SIO) and Detective Chief Inspector (DCI) Steve Brunskill as SIM. Agreed terms of reference were drawn up at the meeting: “The SIM will take responsibility for the identification of the victims and this will include; casualty bureau, victim recovery, mortuary procedures, family liaison, ID commission, and survivor centre.” The major incident room (MIR) was located at Lancaster Police Station.

At 8:30 a.m. February 6, Brunskill informed HM coroner Howard McCann of the circumstances surrounding the deaths. With McCann’s consent, Alison Armour was appointed as lead Home Office pathologist. During Friday afternoon, Armour, Brunskill, Dick Venables (from the major disaster action team [MDAT]), and DI Martin Clague (the mortuary documentation officer) held a briefing for police officers and staff who were to carry out mortuary procedures in relation to the 19 victims recovered at the time.

The task of identifying the recovered victims as well as naming the two missing individuals, all of Chinese origin with an estimated worldwide population of 1.3 billion, was a daunting one, particularly as it was anticipated that most, if not all, had entered the country illegally. The coroner decided that four primary methods would be acceptable to confirm identity: DNA, fingerprints, odontology, or a unique medical condition (UMC). This was based on the advice of the SIM and the recommendations of Lord Justice Clarke (2001, pp. 75–76) during his inquiry into the *Marchioness* disaster. Secondary evidence types included personal property and authenticated documentation with visual confirmation of identity accepted only as supportive evidence.

The coroner instructed that full invasive postmortem (PM) examinations should take place based on the likelihood of criminal proceedings. A decision was made that all of the victims would remain in the RLI mortuary throughout the entire DVI process and that a temporary mortuary would not be required. This was based on the fact that the PM procedures could be carried out over the weekend of February 7 and 8 without interrupting normal business. To facilitate this, the mortuary was closed to normal business and over the next few days was used solely for the PM examinations of the drowned victims. It was anticipated that sufficient storage was available for hospital deaths and that others could be diverted to surrounding mortuaries. PM examinations commenced on the morning of Saturday, February 7, and continued until Sunday, February 8. Due to the number of victims, a further Home Office pathologist, Paul Johnson, was engaged to assist Armour with the examinations. Two teams consisting of a pathologist, anatomical pathology technologist (APT), scribe, exhibits officers, photographers, and fingerprint staff were able to work simultaneously and comfortably in the space available.

As part of the PM examination, the SIM instructed that Interpol DVI forms (Interpol, N.D.) should be completed, as this would allow for an exchange of information with China in a format that was usable and recognized worldwide. Each victim was photographed with the bag containing clothing that had been removed during admission to the mortuary. Fortunately, these bags had been stored in the same refrigerated compartment as the body; consequently, it was possible to photograph individual items and exhibit them as per recognized victim recovery procedures. Personal effects were also recorded at this stage, and all of this information proved very useful as the identification process developed. Each of the victims was subject to the following mortuary procedure:

- Full facial digital and 35 mm photographs
- Full body 35 mm photographs
- Clothing and personal items photographed and exhibited individually by the Home Office pathologist and police exhibits team
- Interpol DVI forms completed, detailing all visible physical features and descriptions of clothing
- Full sets of fingerprints obtained by Lancashire police's fingerprints bureau staff
- Fingerprints "quick scanned" by a team of UK Immigration Service officers
- Full Home Office standard PM examination carried out to determine cause of death
- Blood samples taken so a full DNA profile could be obtained as well as for toxicology screening

On Monday, February 9, Gordon Copley, a forensic odontologist, was appointed and attended the mortuary at RLI to examine all of the victims. The odontological assessments took place on Monday and Tuesday, and the following procedures were undertaken:

- The teeth were photographed and x-rayed
- Dental abnormalities were recorded
- Dental work was recorded
- Full dental history and findings report was submitted

PM examinations following the same procedures were carried out on the two victims recovered over the subsequent days and months, and all victims were found to have drowned. Following the PMs, a full report detailing all of the findings was submitted to the major incident room. Although information relating to primary identifiers was collected as part of the PM

process, including odontological examination in the belief that there might have been antemortem (AM) dental records available for comparison, it later transpired that the victims had very little decay, mainly due to a healthy diet; consequently, no AM records were available. Photographic comparison of the teeth against AM pictures was, however, a useful aid to identification.

The identification management structure had been put in place by 10:00 a.m. February 6 as follows: SIM, deputy SIM, mortuary manager, family liaison coordinator (FLC), victim recovery manager, survivor reception manager, and casualty bureau liaison officer. The management of this structure was reliant on mutual aid from other forces, including the casualty bureau activated at 7:00 a.m. February 6 and located at Greater Manchester Police (GMP) Headquarters, in the northwest region and operated by GMP on behalf of the lead force. Details of the tragedy together with telephone numbers for the bureau were then released through all media outlets. The casualty bureau was resourced over the next 4 days; during that period only 46 calls were received, mainly from journalists working abroad, resulting in only 14 potential names of missing persons. Compare this with the number of calls one would expect to receive following an open incident that had occurred in the United Kingdom including a similar number of predominantly UK-based citizens: For example, following the King's Cross fire in 1987, in which 31 people died, the casualty bureau logged details of over 10,000 potential missing persons. As a consequence of this poor result after the Morecambe Bay drownings, the SIM made the decision (Figure 15.3) to categorize all of the 14 missing persons reported at that stage as "believed to be involved" and assigned a family liaison officer (FLO) with an interpreter to each family.

The casualty bureau telephone number was then transferred to a separate room adjacent to the identification suite at Lancaster police station, allowing GMP to close its bureau. This pseudo casualty bureau was staffed at optimum times, allowing for the time-zone differences, with a backup answer phone in both Mandarin and English available at other times. A liaison officer was appointed to ensure that information was shared between the identification room and the casualty bureau. The identification room staff then collated information from the disaster victim identification documentation completed at the mortuary, survivor descriptions, documentation, and telephone and fax information provided by relatives and other persons contacting the bureau. Finally, a family reception center was opened at the Clarendon Hotel in Morecambe, which was staffed with resources from police and social services family liaison officers. As it transpired all of the families lived in China, and due to the uncertainty initially of who was involved, no family members were able to attend this center.

Nine AM photographs were obtained from immigration services, linked by the victims' fingerprint identification. These were then forwarded to the Chinese police for visual identification purposes. To further facilitate the AM

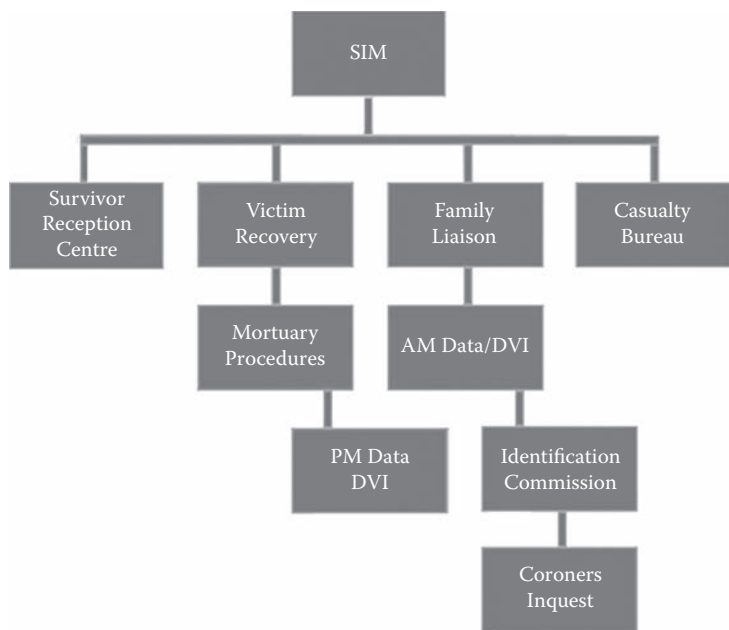


Figure 15.3 SIM responsibilities.

data harvest, the Immigration Service allocated two permanent members of staff to work with the identification team, which allowed direct access to immigration files. This line of investigation provided vital evidence regarding the identity of nine deceased victims. This is recognized as good practice as it allows for a seamless sharing of information for a common goal—the identification of the victims. Some of the victims had come into contact with the Immigration Service through arrest or as part of the political asylum process. During this contact, fingerprints and AM photographs had been obtained and a file containing family details created. Though these files were not always accurate as they relied upon the honesty of the interviewee, which is highly influenced by the means and reason of entering the country, they did hold some useful information that could be compared with that contained in the casualty bureau and family liaison logs. The AM photographs proved very useful in tracing victims’ families in China.

The family liaison strategy was formed by the FLC in association with the SIM. Initially, four family liaison officers were employed, reduced to two officers after one week, each of whom worked with a specially selected interpreter. It soon became apparent that not all of the interpreters could deal with bereaved families without becoming very upset themselves, as unlike FLOs they are neither trained, nor used to dealing with persons in such distress, and their own welfare had to be considered. All those involved with the families were given access to counselors and were subject to additional

monitoring. A series of generic memos was created to ensure that families were provided with timely and relevant information in relation to the incident and identification process in a structured way. This system was recognized as good practice and was used by the family liaison coordinators during the identification of the victims of the July 7 bombings in London just over a year later.

The identification commission, chaired by McCann, met at Lancaster police station on Monday, February 9, 2004, 4 days postincident. Attendees included Armour, Brunskill, Gradwell, Clacque, Venables, Kellett (the initial family liaison coordinator), and Broadbent (the coroner's officer). As a result of this meeting, the main lines of inquiry to be pursued were as follows:

- Development of DNA from blood samples obtained during the PM examinations
- Fingerprint searches for police and immigration records
- Investigation of personal items found on the bodies
- Liaison with the Immigration Service
- Casualty bureau information
- Liaison with the Chinese police and authorities
- Survivor interviews
- Fishing permits
- Property recovered from the house searches, to include latent fingerprints and DNA exhibits
- Media assistance

The coroner authorized a comparison of the DNA profiles obtained during the PMs with the National DNA Database (NDNAD). This immediately resulted in two matches of AM and PM profiles for males 11 and 14. A fingerprint search of police and immigration records, using the National Automated Fingerprint Identification System (NAFIS) system of identification, resulted in a total of 13 matches against records already held: The matches were in relation to males (with the prefix "M") 1, 2, 4, 5, 8, 9, 10, 12, 14, 15, 16, and 18 as well as females (with the prefix "F") 2. By using M or F as a prefix for male and female, each body therefore had a unique reference number (URN). This was started by the officers in the mortuary on the night of the incident, and this unique letter-and-number combination stayed with the body throughout the identification process.

Following the tragedy, the survivors were provided with accommodation at Lancashire Constabulary training school. This ensured their personal safety as well as access to consular staff and legal advice for those who wished it. Through interpreters, detectives were able to interview the survivors using video interview facilities. However, very little information of any value was gained in relation to the identification of the victims; even though these

individuals had worked and lived together, a system of nicknames was used rather than correct identities. This may have been because of their illegal status or for their personal security. In addition, the survivors were fearful of those who had smuggled them into the United Kingdom.

Some other useful information was obtained from the survivors, however, that led to searches at a number of multioccupancy dwellings in the Merseyside area, in houses thought to be the homes of the deceased victims. Unfortunately, very little personal information that assisted the identification team was recovered as most individuals under the control of the traffickers kept their meager possessions with them for safekeeping. The SIM considered the possibility of obtaining latent fingerprints or DNA during these searches, but this was quickly ruled out due to a lack of attribution to identified individuals.

The original scene on the night and subsequent days following the incident had presented specific challenges to the investigating officers, not least of which was the initial victim recovery, as this included searching a crime scene of hundreds of square miles of water, sand, and quicksand. This search and recovery operation continued as the victims' personal effects were still being recovered. A trawl of the surrounding water, beaches, and cockle beds resulted in various items of property being located, including 36 fishing permits. This was a short-lived boost to the identification process when further examination of the permits revealed that not only did they not contain proper identities but they also did not even represent those engaged in fishing on the night of the incident.

Early contact with the Chinese Ministry of Public Security (Chinese MPS) in Beijing was secured through the National Criminal Investigation Service (NCIS) Interpol. The Chinese Consul in Manchester, was also contacted and invited to assist the investigation. Superintendent Mathew Kwok, a Chinese police officer seconded to Interpol, Lyon, arrived in Lancaster on Tuesday, February 10. His attendance assisted the identification team enormously and helped develop an excellent working relationship with MPS in Beijing. This working relationship was arguably the most successful line of inquiry for the identification team. It is correct to say that without this assistance the victims would never have been identified. The SIM formed a very strong working relationship with the aforementioned agencies, in particular with Zuo Zhijin, MPS Beijing, a DNA expert who had served 2 years with Interpol in Lyon specializing in disaster victim identification. Zhijin led a team of five officers who visited the families of the victims already provisionally identified by the Lancaster identification team or through MPS's own inquiries. The requirement to exchange information through official channels was adhered to; however, this was a very slow process. In the spirit of the Clarke (2001b) recommendations, an early decision by the SIM to exchange information direct by telephone and e-mail with Zuo further facilitated this process and led to

the provisional identification of the majority of the deceased. The Chinese police were able to carry out visual identification procedures using the photographs from immigration records or passport applications and complete the AM documentation. Digital image capture of the victims allowed for easy and immediate transfer of information where required without the need for scanning. This good practice has now been incorporated into national SIM and DVI training (Black et al., 2007).

On March 8, 2004, the Chinese and British policing teams met at Lancaster and compared the AM information obtained by the Chinese authorities with the PM information obtained by the British team. As a result of this cooperation, 18 of the 20 victims recovered at that time were provisionally identified within the first 2 days. Over the next few days, other lines of inquiry were established that led to identification of the final three victims. In April the British team visited China and met with all 23 victims' families, thus allowing officers to perform a more conventional family liaison role. Personal items of property recovered during the investigation were shown to the relatives and other identification data shared, including PM photographs of the deceased. Where personal items of property were identified they were returned to the next of kin. This visit also served as a primary AM identifier harvest: DNA samples were taken from parents, spouses, and children for familial comparison to the victims. Final results were received from the Forensic Science Service within 2 weeks of the team's return to the United Kingdom. Feedback from the families and Chinese authorities later indicated that this was a necessary and successful visit for the victims' families.

Conclusion

The investigation and DVI process for this disaster was compassionate, thorough, prompt, and, above all, professional. There were significant and situation-specific difficulties encountered, such as the following:

- The lack of information initially available regarding the victims
- The complication of false details repeatedly encountered in relation to the victims due to the illegal status of some
- The fact that the victims' families were predominantly 5,000 miles away in China
- The reluctance of the survivors to engage with investigation due to fears of admitting involvement

Despite this, the response to the incident was well organized and effective, with 21 of the victims being recovered, 19 of whom were found within the first 24 hours of the tragedy occurring. A diverse range of agencies were

used throughout, from the search and rescue effort through to the subsequent DVI process and investigation. The use of an experienced DVI consultant to assist the processes also demonstrated the desire to get things right. In addition, the choice to use DNA as the main source of primary identification evidence and the early establishment of a major incident room and survivor and family reception centers illustrate the desire to perform efficient and effective information gathering, both AM and PM as well as the care afforded to those affected by the disaster. All of these procedures contributed to the DVI process achieving its purpose—the positive identification of all 21 recovered victims.

After the Event

There is no doubt that the identification of the victims of this disaster was a success, and many investigative techniques applied in this incident are now considered good practice. However, there are, as always, strengths and weaknesses to any investigation. For example, it is now recognized that both the SIO and SIM should have been notified earlier so that appropriate investigative responses could have been initiated sooner; this occurred almost 12 hours postincident and led to a failure on behalf of the officers recovering the bodies to follow standard operating procedures. However, it is also recognized that the police officers who carried out these extremely distressing duties throughout that night did the very best that they could within their training and experience.

In addition, Brunskill was an experienced SIO and had received SIM training in September 2003. This training was based on past transport disasters and almost entirely focused on mortuary operations. This course alone did not meet the needs of an SIM responsible for the identification of foreign subjects in these circumstances. Also in relation to training, at the time of the incident, although SIO- and SIM-level training was under way having begun in May 2003, training for body recovery and mortuary officers did not become a priority for nearly another year; the Asian tsunami December 26, 2004, galvanized British forces to develop DVI teams. As a result, the majority of the staff used in the DVI process following the Morecambe Bay incident had received little or no training, with only the SIM having taken any formal training. This would not occur today, as it is readily acknowledged that work undertaken during a DVI deployment is difficult, intense, and stressful. This same lack of trained personnel quickly available for deployment resulted in the first few victims recovered being searched and stripped prior to being submitted for full DVI procedures. Teams consequently had to reprocess these victims as though receiving them in their initial presentation. Again, established procedure would ensure that strip

and search occurs in the mortuary, with a DVI team available to process and document everything.

As is often the case, the benefit of hindsight has allowed learning objectives to be recognized in relation to the identification process following the Morecambe Bay cockle pickers' drowning, including the following:

- In any incident where there is a likelihood of mass fatalities, an SIO and an SIM should be notified at the earliest opportunity.
- Fully trained body recovery and temporary mortuary staff should be used from the very outset of the response.
- The use of a hospital mortuary provides an ideal working environment for those involved in the DVI process. When making a decision to use such facilities, additional body storage should be put in place immediately to prevent disruption to normal business. If this cannot be achieved then an emergency mortuary should be considered.
- Before embarking upon expensive and time-consuming collection of PM DNA, odontology, or fingerprint comparison sets, the investigator should consider the realistic availability of AM data. In this case only DNA could be used as a primary identifier.
- Digital photography provides greater flexibility in DVI work and should always be the first choice.
- Current guidelines should be strictly adhered to when engaged in body recovery, strip, search, and subsequent mortuary procedures.
- Clothing should not be removed from the body until it has been photographed *in situ* and then only during a DVI search and strip procedure.
- Interpreters used in DVI work should be provided with additional training and support similar to family liaison officers.
- Licensing authorities should ensure that persons issued with permits to undertake cockling or other similar hazardous work are required to produce bona fide identification. Consideration should also be given to the obtaining of applicants fingerprints as part of the licensing procedure.
- When faced with a national incident with significant international implications, engage and consult with an authority on the relevant culture sooner, including discussion of any cultural and religious nuances that may potentially affect or impact the identification procedure. For example, some of the victims in this case had a red identity wrist tag attached to their wrist in the mortuary; later it was recognized that in Chinese culture the color red signifies good luck and happiness. These wristbands were replaced by the police prior to repatriation.

The 23 victims of the Morecambe Bay disaster were vulnerable people, exploited by a criminal gang master who showed little or no regard for human

life. Their unfortunate demise brought the cocklers' plight to the attention of the world. The victims deserved to be treated with dignity in death and to be successfully identified and repatriated home to their families. They also deserved justice to be served upon the individual that had caused their deaths.

On June 22, 2004, all 21 victims recovered from Morecambe Bay were formally identified at the identification inquest chaired by McCann, at the Coroners Court, Lancaster. The police told the coroner that they believed 23 individuals had perished on the night of the tragedy, even though only 21 bodies were recovered. The coroner commended the authorities in Morecambe "to the highest level" for their actions in the days following the tragedy. Although it took over 4 months for the official inquest to take place, due to the diligence and hard work of the individuals involved in identifying the victims the families were aware that their loved ones were involved within a matter of days, and the visit by the British team in April was able to confirm their fears. All of the recovered victims were subsequently repatriated to their families in China. This allowed the majority of the victims' families the necessary closure, although it should be remembered that of the 23 individuals that went missing that day 2 have never been found.

In this case, the DVI team achieved its aim—all of the victims recovered were identified, and a genuine compassionate service was provided to their families, despite the distance in terms of geography and culture. Most areas that could be improved upon in terms of service provision would now be addressed by the DVI development program. So all were identified successfully and securely, and evidence was secured for the criminal investigation, which resulted in Ren receiving a 14-year sentence for the manslaughter of the 21 recovered victims. He remains incarcerated to this day, with a recommendation that he be deported back to China when released. This tragic loss of life is commemorated on a plaque placed near to the location so that the victims of the incident may always to be remembered with respect.

Acknowledgments

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References

- Black, S., Walker, G., Hackman, L., and Brooks, C. 2011. *Disaster Victim Identification: The Practitioner's Guide*. Dundee University Press. Dundee, Scotland.
- Clarke, Lord Justice Kenneth. 2001. *Public Inquiry into the Identification of Victims Following Major Transport Accidents*. Available from: Department of the Environment, Transport and the Regions.

Interpol. ND. Disaster Victim Identification. Available from: <http://www.interpol.int.PublicDisasterVictim/default.asp> (site accessed March 3, 2011).

Lancaster City Council, District Emergency Plan, Version IV 3.0. Available from: <http://www.lancaster.gov.uk/planning-environment/environmental-health/emergency/> (site accessed March 3, 2011).

London Bus and Underground Bombings, July 7, 2005

16

GRAHAM WALKER
XANTHÉ MALLETT

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Introduction

On Thursday, July 7, 2005, a coordinated suicide terrorist attack was carried out at the heart of London's transport system during the morning rush hour. The chaos began following the first report of an explosion at 8:50 a.m., with two further explosions on London's underground system and one bus bomb, killing 52 innocent people and the 4 suicide bombers. All four of the bombers were British Muslim men, three of Pakistani and one of Jamaican descent. The Metropolitan Police Service (MPS) was the responding force, with large numbers of officers attending the incident sites, with support from SO13 Anti-Terrorist branch and British Transport Police (BTP). This incident is now commonly referred to as 7/7.

Circumstances

The first report came in at 8:50 a.m. that an explosion or train collision had occurred between Liverpool Street and Aldgate tube stations—at this stage the reports from the two stations suggested separate incidents. The second explosion, between King's Cross and Russell Square, was initially reported at

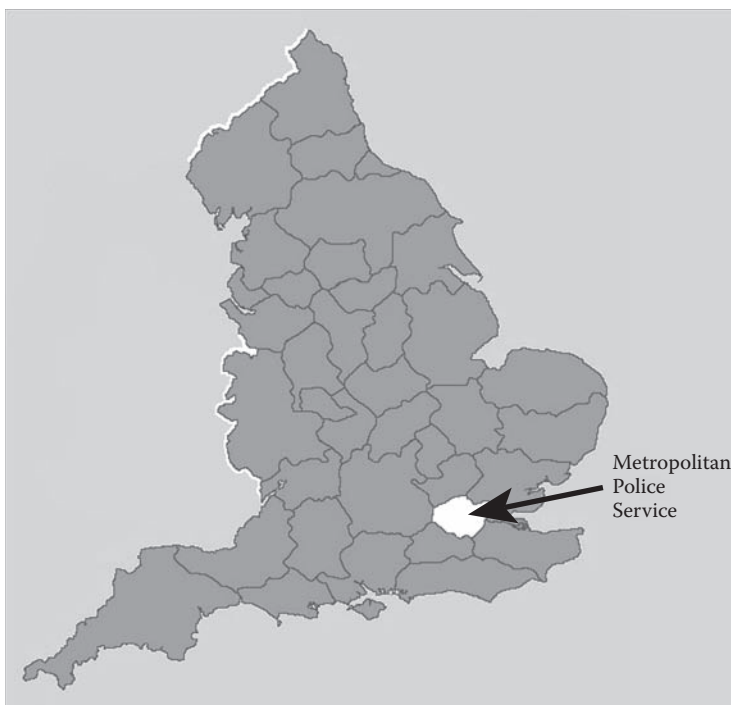


Figure 16.1 Policing regions of England with Metropolitan Police Service boundaries highlighted.

8:56 a.m. and the third at 9:17 a.m. at Edgware Road. It later transpired that all three detonations had taken place within 15 seconds of each other at around 8:50 a.m., but the scale of the attack overloaded the reporting mechanisms. At the time of the incidents, the only people actually aware of what had happened were the passengers on the trains themselves, but with no mobile phone service down in the tunnels, they were unable to telephone the emergency services for help or report what had actually occurred. The underground network was quickly evacuated, following its emergency plans. This process was very well executed, particularly considering it was only the second occasion in living memory on which the entire network had been evacuated.

The Metropolitan Police Service (Figure 16.1) was the responding force, with support from SO13 Anti-Terrorist Branch (now SO15) and the British Transport Police. At 9:29 a.m. the MPS press office confirmed that a major incident had occurred (The Stationary Office, 2006), and due to the scale of the attacks and the fact that there were multiple sites the police were inundated with initial reports. In addition, there were numerous false reports within the first hour, requiring police attendance to investigate.

At 9:47 a.m., with the emergency services already stretched to the limit but gaining control at the three underground sites, the bomb aboard the

Number 30 bus at Tavistock Square was detonated. As a result, within the next hour London's entire transport system was shut down, with initial reports suggesting around 20 people had lost their lives. All four bombs had been concealed in rucksacks, were inexpensive to make, and required little expertise in their construction.

Within 2 1/2 hours of the initial attack, at 11:10 a.m., MPS commissioner Sir Ian Blair confirmed that a coordinated terrorist attack had taken place and appealed for calm, asking people not to travel to London or make unnecessary calls to the emergency services. Prime Minister Tony Blair was at the G8 summit in Scotland at the time of the attacks, and at 12:05 p.m. he spoke for the first time about the incident, calling them "a series of terrorist attacks. ... We [G8 leaders] condemn utterly the barbaric attacks" (Blair, 2005). The prime minister then returned to London to lead the government's response to the bombings.

At this stage the London mass fatality plan was activated, which provides for an integrated emergency response to incidents involving mass casualties in London, including a mass evacuation plan (LRRF, 2008). This plan had been developed by the London Regional Resilience Forum (LRRF, n.d.), a partnership of London's key responders (e.g., emergency services, local authorities, transport agencies, utilities, voluntary services, military) in response to the attacks in the United States on September 11, 2001. The aim of this group was to ensure that London was well prepared to deal with any emergency, including a coordinated and multisite attack. The role of the LRRF was tested as part of "Atlantic Blue," an international exercise that took place in April 2005. The scenario in this exercise included multiple attacks on the underground system and enhanced the familiarity with roles and no doubt contributed to the overall effective response by the agencies involved.

A coincidental yet significant factor in the ability to respond was that Operation Bracknell, the British operation dealing with the identification and repatriation of UK citizens from the southeast Asian tsunami (December 26, 2004), had been operational for 7 months. Staff and systems, in particular, the Home Office Large Major Enquiry System (HOLMES; information technology system used by UK police forces) were match fit in a manner that can only be brought about by live critical incidents. Additionally, members of the senior command structure were familiar with each other and the processes required for effective disaster victim identification (DVI).

A total of 52 people died at the four bomb sites, plus the four suicide bombers. In addition, approximately 700 people were injured: Around 350 were treated at the scene and the remaining 350 in hospitals, 100 for one or more nights and 22 in serious or critical conditions. The name of the bomber and the number of deceased at each site were as follows:

- Shehzad Tanweer (22): Aldgate tube, killed 7
- Mohammed Sidique Khan (30): Edgware Road tube, killed 6

- Germaine Lindsay (19): Russell Square tube, killed 26
- Hasib Hussain (18): Tavistock Square bus, killed 13

Bomb Sites

Bomb 1, Circle Line

The first bomb exploded on the eastbound Circle line subsurface train 204, traveling between Liverpool Street and Aldgate stations (Figure 16.2). The train had left King’s Cross St. Pancras around 8 minutes before the explosion occurred, and at the time of the explosion the third carriage of the train was approximately 90 meters (295 feet) along the tunnel from Liverpool Street station (Figure 16.3).

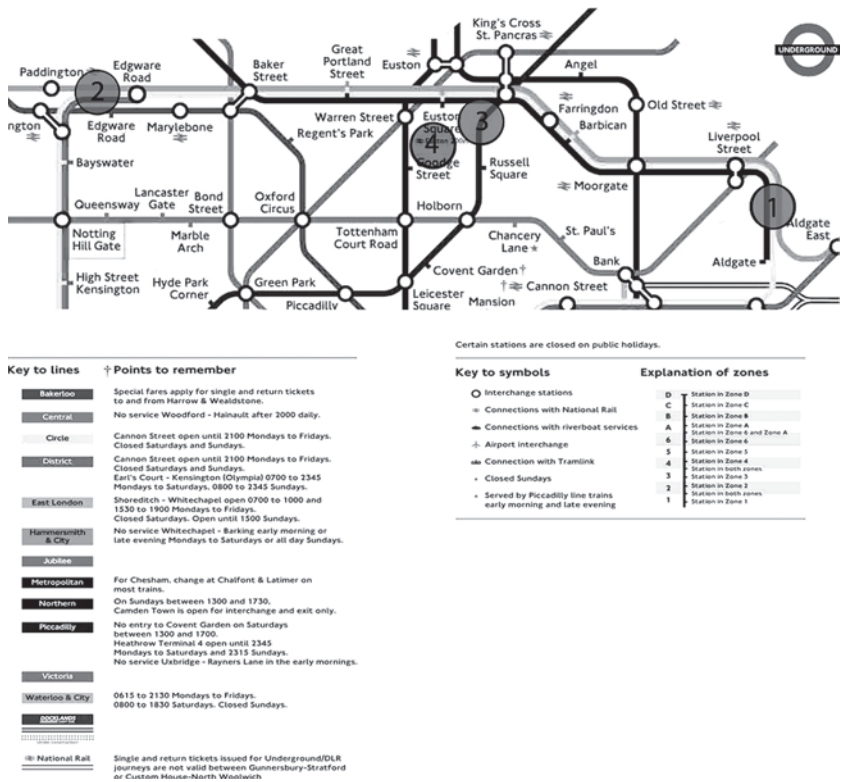


Figure 16.2 Map showing the bomb sites in relation to each other. Red circles denote explosions on the London underground; the blue circle denotes the explosion in Russell Square at street level. 1, Bomb 1, on the Circle line, between Liverpool Street and Aldgate underground stations. 2, Bomb 2, on the Circle line, between Edgware Road and Paddington underground stations. 3, Bomb 3, on the Piccadilly line, between King’s Cross St. Pancras and Russell Square underground stations. 4, Bomb 4, in Tavistock Square at street level. Available from <http://www.london-tube-map.co.uk/> (accessed May 21, 2010).



Figure 16.3 Bomb damage caused to the Circle line tube train. (Photo courtesy of Rex Features.)

Bomb 2, Circle Line

The second bomb also exploded on the Circle line, this time on the second carriage of westbound underground train 216. The train had just left Platform 4 at Edgware Road and was heading for Paddington Station. The train had left King's Cross St. Pancras approximately 8 minutes previously. There were several other trains nearby at the time of the explosion, including an eastbound Circle line train (arriving at Platform 3 at Edgware Road from Paddington) that was passing next to the train; it was damaged. The Circle line is a subsurface tunnel, approximately 7 meters (23 feet) deep. This line is relatively wide, as it consists of two parallel tracks. The two explosions on this line were less destructive, due to the force being dissipated along the wider tunnel.

Bomb 3, Piccadilly Line

The third bomb was detonated on southbound Piccadilly line subsurface train 311, traveling between King's Cross St. Pancras and Russell Square. The bomb exploded approximately 1 minute after the train left King's Cross, by which time it had traveled about 260 meters and was around 450 meters from the platform at Russell Square (Figure 16.4). The explosion took place at the rear of the first carriage of the train (Car 166), causing severe damage to the rear of that carriage as well as to the front of the second one. The surrounding tunnel also sustained damage. The Piccadilly line consists of a deep tunnel, 30 meters (100 feet) underground in places, with narrow (3.5 meters, or 11

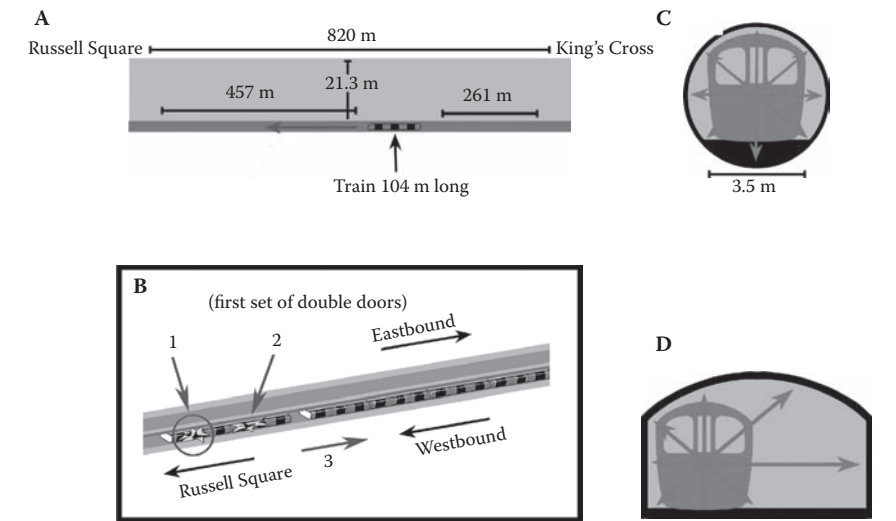


Figure 16.4 Schematic showing the relative position of the tube train between King's Cross St. Pancras and Russell Square. A: approximate dimensions and location of train showing depth of tunnel below street level (21.3 m), length of train (104 m), distance between the two stations (820 m), and approximate distance of train from King's Cross (261 m) and Russell Square (457 m) stations. B: (1) bomb exploded in first carriage near first set of double doors; (2) second carriage badly damaged; teams removed the remaining four carriages. C: tube tunnels—in single-track tunnels found on the deepest lines including the Piccadilly line, a blast is contained within the restricted area. D: subsurface tunnels—two-track tunnels, found on shallower lines, allow the blast force to dissipate.

feet) single-track tubes and just 15 cm clearances to the side of the train. This narrow space reflected the blast force, concentrating its effect. The platforms at Russell Square are reached via three lifts or 177 steps. The tunnel is coated in white asbestos cement, which was damaged by the blast.

The only mechanism for air circulation through the tunnels and along the platforms occurs as a result of the movement of the trains, which stopped when the damaged trains plugged the tunnels. With temperatures reaching 60°C, not only was the environment hazardous due to debris, the asbestos plaster, and any remaining danger of secondary blasts, but also the air quality soon became very poor. No natural air was reaching the people on the platforms or later the recovery teams, a situation requiring regular assessment using CO₂ monitors placed along the entire 600-meter access route to the train from the platform at Russell Square.

Bomb 4, Tavistock Square

The fourth and final explosion occurred above ground on the road system at 9:47 a.m. in Tavistock Square, on the Number 30 bus. This double-decker



Figure 16.5 Aftermath of the London bomb blasts in Tavistock Square. (Photo courtesy of Eddie Mulholland/Rex Features.)

had been in service for 2 years and was traveling a circular route from Marble Arch through the King's Cross area to Hackney Wick at the time of the incident. It left Marble Arch at 9:00 a.m. and arrived at Euston bus station at 9:35 a.m., where crowds of people had gathered as they had been evacuated from the underground and were boarding buses trying to leave the immediate area. The explosion ripped the roof from the top deck of the vehicle and destroyed the back of the bus, which was more vulnerable than the front, which is fortified to withstand collisions with bridges (Figure 16.5).

Victim Recovery and Identification

This was an open incident, with no information available regarding who may have been on the transport system at the time the bombs were detonated. Although emergency services were able to access all four locations quickly, it soon became apparent that the underground stations did not stock sufficient medical supplies to deal with a mass fatality incident (MFI) of this scale and with this number of casualties, a problem highlighted in the subsequent London Assembly report (Greater London Authority, 2006).

Initially, the number of victims was unknown, although it became apparent as the events unfolded that the existing mortuary facilities available to receive the deceased would not be sufficient. There was also the possibility that further attacks and subsequent loss of life would take place that day. Consequently, during the afternoon of July 7 the decision was taken to



Figure 16.6 Resilience mortuary. Staff area included changing facilities, showers, toilets, and PPE collection point. The evidence suite contained domestic-type refrigerators and freezers as well as isolation freezers (contained in two small structures). The far left-hand portion of this structure contained offices for forensic specialists, such as pathologists and odontologists. (Photo courtesy of De Boer.)

establish a resilience mortuary (a demountable structure). A request was made to De Boer, a private company specializing in temporary accommodation, to supply the facility. This was not the first time De Boer had supplied similar structures within London and consequently had experience in this area.

The level of preplanning, together with recent experience shared through the tsunami, enabled swift progress to be made in terms of design. Location issues were also well dealt with. A potential sticking point was the issue of funding. This was not resolved until very late on July 7. Credit is due to the flexible approach of De Boer management, as it committed considerable resources to the mortuary while not in possession of any signed contractual agreement.

The temporary mortuary (Figure 16.6) was established within 24 hours on the grounds of the Honourable Artillery Company in inner London. It was furnished with an existing stockpile of equipment funded by the Home Office and provided by De Boer. The mortuary included a postmortem (PM) suite with six fully equipped workstations as well as areas for odontological assessment, fluoroscopy, radiology, photography, and scenes of crime officers to work. Importantly, four separate reception and storage areas were provided for the deceased, with each bomb site being designated a separate area to avoid cross-contamination among scenes. A family viewing area as well as office accommodation and meeting rooms, a canteen, staff showers, changing rooms, and a personal protection equipment (PPE) collection point were

also provided. Over 250 staff could be on site at any one time. Therefore, the facilities had to be robust and large enough to accommodate this number of people; one of the benefits of using a temporary mortuary is that it can be extended if required.

At an early stage the MPS invited Disaster Action (DA), a charity set up to represent the interests of survivors and the bereaved involved in both national and international incidents, to act as lay advisers to the friends and families of the 7/7 victims. Members of DA became involved in their invited capacity at the family assistance center, which opened within 48 hours of the incident taking place. The experience gained from dealing with those affected by previous disasters such as the terrorist attack in New York in 2001 and the Asian tsunami in 2004 allowed DA's representatives to become credible advocates for those affected.

The MPS also invited then ACPO Lead for DVI, ACC Graham Sunderland, to advise on DVI matters. A casualty bureau was established, and officers were deployed to receiving hospitals to collect information from survivors and take reports of missing persons. A telephone line that friends and families could call was advertised; over 4,000 calls were received. The casualty bureau then split the reports into three categories:

1. Known to have been at the bomb site
2. Known to have been in the area at the time
3. Known to have visited London on that day

Communication was a significant problem for the responding forces, as the phone systems at the coordination center at New Scotland Yard (NSY) failed and the mobile phone networks had become very congested. In addition, travel was significantly impeded, preventing responding team members from accessing sites, after being deployed at 6:00 p.m. The scenes themselves would also prove very challenging, and it was not until 6:00 a.m. on July 8 that SO13 and DVI team leaders met to discuss the way forward.

The two sides of the evidential recovery had to be balanced at this stage: The DVI teams focused on victim recovery and identification; SO13 officers focused on the criminal investigation. Historically, SO13 would have had unilateral responsibility for the scenes. Senior managers and staff from SO13 had played significant roles in the SE Asian tsunami operation and had a good understanding of DVI. Furthermore, they recognized that an intelligent and coordinated deployment of DVI staff alongside specially trained counterterrorist crime scene investigators would have the following dual benefits:

- Identifying the perpetrators and their support networks
- Promptly identifying and repatriating those killed by the criminal act

Consequently, DVI processes were explained as were the priorities for SO13. It was agreed that four teams would deploy to the sites to recover the deceased and simultaneously forensically recover the bomb scenes. Each recovery team consisted of the following:

- Two DVI officers
- One SO13 exhibits officer and team leader, who would exhibit all items recovered including the deceased
- Two SO13 officers
- One photographer

In addition, a refrigerated temporary body-holding area, cordon controls, and decontamination facilities were agreed. Under advice from the DVI team leader, demarcation lines were set up designating “clean” (or “dry,” or not contaminated) and “dirty” (or “wet,” or biologically contaminated) areas. The appropriate PPE for each level of entry into the site was agreed and enforced by the DVI teams. General health and safety became the responsibility of the DVI team deputy, liaising with Simon Hargreaves of 4-Rail, who was responsible for all health and safety issues on the underground system. DVI team members were vetted by occupational health for suitability to deploy to such dangerous and stressful working environment; however, the SO13 staff and BTP officers staffing the body-holding area had not been checked. The DVI team leader briefed the SO13 team leaders regarding signs and symptoms of occupational stress and then monitored the SO13 staff members, referring them to occupational health advisers when required. BTP officers were more difficult to support. On July 13, a BTP officer was found checking body labels and behaving strangely; he had lost a family member in the bomb on the Piccadilly line. This had not been picked up by BTP supervisors and was dealt with by DVI team leaders. A process of vetting BTP staff deployed to the site was then initiated, and full debriefs were introduced.

The body-holding area was set up using refrigerated storage, and recording continuity of recoveries was made in a body-holding area log. An issue that arose and caused problems was the unreliable attendance of the mortuary transport to the site for collections. On numerous occasions transport was requested and failed to attend. This occurred because vans were attending all sites on rotation and would often take several hours to negotiate the busy London traffic. Additional concerns were raised due to the potential of cross-contamination this may have caused among the four crime scenes.

The process of body recovery was delayed due to a number of factors, a situation that caused considerable criticism from the media and public. However, few would have been able to understand the difficult circumstances in which the recovery teams found themselves. For the teams working in the underground, factors such as poor air quality and high temperatures,

the fear of secondary devices and tunnel collapse, and the dust that greatly reduced visibility all made the recovery process extremely difficult. Add to this that the devices had been detonated some hundreds of meters into the tunnels, in extremely confined spaces now filled with debris, and one can begin to understand some of the problems the teams faced. In addition, from an early stage this was recognized as a terrorist attack; consequently, SO13 had to undertake detailed forensic examinations to retrieve any material used to produce the bombs or that may have helped identify the perpetrators. This included tiny fragments of the device that could easily be accidentally removed from the scene (e.g., caught on someone's shoe) and without which those responsible may not have been traced.

The first deceased individual was received at the temporary holding area during the evening of July 8. Mortuary examinations took place between 8:00 a.m. and 8:00 p.m. daily. Dr. Robert Chapman acted as lead pathologist and was responsible for coordinating the PM procedures; he was assisted by pathologists from other parts of the United Kingdom on a rotating basis. Digital and computed radiography were used for the first time in the temporary mortuary to assist in identifying the victims, with a team of radiologists working within the PM suite comparing PM images with those taken from potential victims' antemortem (AM) medical records. This allowed a variety of different structures to be visualized on the same image and helped identify foreign objects, including both metallic and nonmetallic fragments, which had to be extracted and identified as they may have been part of the bomb.

Victims' clothing and personal effects were photographed as they were removed. The vast majority of the examinations were external only, with physical characteristics such as scars or tattoos being noted on the pink (PM) Interpol forms (Interpol, 2002b). Internal artifacts (e.g., pieces of metal) had been detected during x-ray or fluoroscopic examination. Cause of death in all cases was as a result of the explosion.

Although no official figures are available stating exactly what primary method of identification was used in each case, Chapman stated that the majority of victims were identified through odontological assessment, with a number identified through fingerprint analysis and a few through DNA comparisons. Confirmation of identity was based on AM and PM evidence (Interpol, 2002a, 2002b) presented to the identification commission, and no viewings by family or friends of the victims took place until after the identification commission had accepted the identity in each case.

After the Incident: Inquiry

A number of lessons were learned following this incident. This is always the case following a mass fatality incident on this scale, as acknowledged by the

British Government in a 2006 publication aiming to improve future responses, specifically in relation to supporting the victims as well as the bereaved (UK Government, 2006). For example, on July 7, 2005, a number of different agencies had to work together, each with its own priorities and working practices. It is therefore to be expected that not all mechanisms worked as well as they possibly could. For example, although local authorities make provisions for survivor reception areas, none were used following 7/7. Survivor reception centers (SRCs) are premises identified close to the scene of incidents with the potential to provide initial support for survivors, to provide a place for refuge and reunion, and to allow for the collection of personal data to assist in the identification process and reduce the list of potential decedents. They are intended as a short-term facility only. Failure to implement this measure was later blamed on the pressure of events and concerns over further attacks. A review conducted by the LRRF recommended that suitable premises be identified across London in the event of future disasters.

A further measure that could have been of value in this incident was family assistance centers (FACs), which enable those affected by the disaster to gain as much current information as possible about friends and families who may be involved and provide support, professional advice, and assistance. At the time of the bombings in London there was no FAC plan in existence. A draft plan had been produced, but this had not been shared with the relevant parties. A decision to provide an FAC was taken on July 8, which was initially sited at the Queen Mother's Sports Centre. However, it soon became clear that these premises were unsuitable for the demand placed upon them, and on July 12 the center was relocated to the Royal Horticultural Halls. This secondary location provided improved facilities including more space, private interview rooms, and better welfare provision for staff.

Finally, in terms of elements that could have been improved, anecdotal evidence from a mortuary manager deployed to the London resilience mortuary suggests that there were some health and safety issues within the mortuary. For example, clean-dirty demarcation areas were not clearly highlighted during the initial phase, which meant that the access-egress points had to be policed by the anatomical pathology technologists (APTs). In addition, some staff unused to working within the mortuary attempted to consume fluids within the dirty (wet) side, which was quickly stopped.

A number of elements of this incident worked exceptionally well, however, and require specific note. For example, that a number of agencies were able to make a swift and coordinated response to the events of 7/7 did not occur by chance. Plans were in place to deal with a mass casualty disaster as, although there will always be fluidity within plans regardless of how well thought out they are, each event will be entirely unique and will present unique challenges. An element of excellent forward planning was the London Resilience Plan, the implementation of which following the 7/7

attacks provided the basis for an integrated emergency response, as it outlines the roles and responsibilities of the different organizations as well as issues surrounding the types and locations of temporary mortuaries, family liaison, and the identification process.

The initial establishment of the resilience mortuary was also a considerable achievement, given the scale of the disaster. The fact that De Boer had previous experience in setting up a temporary structure for the victims of the 2004 Asian tsunami undoubtedly helped matters, and it should be noted that any requests for additional accommodation or adaptations were dealt with swiftly. Westminster Council, responsible for managing the mortuary, commended De Boer for its work and positive approach to the task. The viewing facilities provided at the mortuary were highly praised not only by expert visitors and faith leaders but, more importantly, also by the families of the victims. The first family to attend a viewing spent 8 hours within the viewing area, although the average time was 2 hours. This required careful management between the mortuary managers and family liaison officers (FLOs) on site to ensure each family was accommodated.

The MPS also deserves credit for inviting the charity Disaster Action to act as lay advisers to the friends and families of the 7/7 victims. This was the first time that DA had been invited to take on a front-line role in an advisory capacity and displayed openness to the procedures that were taking place and recognition of the need to provide support and information to members of the public. This can only have helped persuade the families of the victims that respect and transparency were of paramount importance to those tasked with investigating the incident.

Today, incidents on this scale are often played out almost live as a result of 24-hour worldwide news. Whenever reviewing the success and failures of a contemporary incident, one must remember that there will always be lessons learned. In the areas where improvements can be made, it comes down to cooperation between partner agencies and the need to plan for all eventualities. Safeguards can be built into plans to accommodate those most affected, and although future events cannot be foreseen, it is possible to predict the scenarios the United Kingdom is most likely to face in the years to come. These plans need to be tested, distributed, and reviewed in line with changing threats and circumstances.

Since 2002 London has had contingency plans in place following the suicide attacks on New York in 2001, and these provided a framework for the response on 7/7. After that time, LRRF conducted a debrief, which highlighted areas where further work is required. This multiagency debrief identified lessons learned in a number of areas, including survivor arrangements, telecommunications, cordons, and assistance from the country sector.

The need to train both suitable and sufficient staff to be able to respond to disasters where mass fatalities are involved is crucial, and, clearly, steps

are being taken to move this forward with the formation of the UK disaster victim identification team (UKDVI). When DVI teams deploy, the following principles are essential:

- The same protocols and standard procedures should be followed as in a non-MFI.
- All teams should be multidisciplinary and multiskilled.
- A multiagency approach is required; there must be an understanding of religious and cultural issues.
- All teams should work closely with those responsible for collecting AM data.

Clearly, funding will always be a limiting factor, and investment needs to continue to ensure the best possible service is provided in these incredibly stressful and intense situations. What can never be overlooked in the immediate aftermath of an incident and the desire to “get the job done” is the need of the victims—not just the deceased but also the survivors and the families.

References

- Blair, T. (2005). G8 Condemn London Attacks. Available from <http://www.news24.com/World/News/G8-condemn-London-attacks-20050707> (accessed May 21, 2010).
- Greater London Authority. (2006). London Assembly Report of the 7th July Committee. UK Government. http://news.bbc.co.uk/1/shared/bsp/hi/pdfs/05_06_london_bombing.pdf (accessed March 3, 2011).
- Interpol. (2002a). Disaster Victim Identification Form: Ante-Mortem (18/2). Available from <http://www.interpol.int/Public/DisasterVictim/Forms/AMForm.pdf> (accessed May 21, 2010).
- Interpol. (2002b). Disaster Victim Identification Form: Post-Mortem (43/02/4). Available from <http://www.interpol.int/Public/DisasterVictim/Forms/PMForm.pdf> (accessed May 21, 2010).
- London Regional Resilience Forum. (LRRF). (2008). Mass Evacuation Plan. Available from http://www.londonprepared.gov.uk/downloads/London_Mass_Evacuation_Plan_april08.pdf (accessed May 21, 2010).
- London Regional Resilience Forum. (LRRF). (n.d.). Homepage. Available from <http://www.londonprepared.gov.uk/londonsplans/resilienceforums/> (accessed May 21, 2010).
- The Stationary Office. (2006). Report of the Official Account of the Bombings in London on 7th July 2005. UK Government. Available from <http://www.official-documents.gov.uk/document/hc0506/hc10/1087/1087.pdf> (accessed September 20, 2010).

UK Government. (2006). Addressing Lessons from the Emergency Response to the 7th July 2005 London Bombings: What We Learned and What We Are Doing about It. UK Government. Available from http://www.londonprepared.gov.uk/downloads/homeoffice_lessonslearned.pdf (accessed September 20, 2010).

Close

It is fair to say that most people will not have heard of the term disaster victim identification (DVI), and, thankfully, nor should they. Unfortunately, however, all victims' families have not only heard of it but have also experienced it. The response of the United Kingdom to the Indian Ocean tsunami in December 2004 was unprecedented, with approximately 800 personnel being deployed to southeast Asia throughout 2005. The impact on the service was immense, and many lessons were learned that were carried over into subsequent major incidents, including the July 7, 2005, London bombings and the terrorist attacks in Sharm El Sheikh later the same year.

The various accounts of mass fatality incidents included in this book are a stark reminder that we, in the United Kingdom, are not immune to such atrocities. Whether they are criminal, accidental, or natural disasters may be somewhat irrelevant to families that have lost a loved one. The work involved to ensure that we, as a nation, are prepared could not continue without the ongoing commitment of the Home Office and the Foreign and Commonwealth Office, which recognize its importance.

It is worth remembering, as we look at these incidents once again, that this area of work exists to provide the families of victims involved in such tragic and horrendous events with the knowledge and confidence that their loved ones will be identified accurately in a respectful and dignified manner. The authorities and many professionals involved in this essential work cannot make the trauma or heartache go away. Without DVI, however, it would be substantially worse.

Graham M. Sunderland QPM
Strategic Director, UKDVI

Disaster Victim Identification

Experience and Practice

Disaster management has become an increasingly global issue, and victim identification is receiving greater attention. By raising awareness through past events and experiences, practitioners and policymakers can learn what works, what doesn't work, and how to avoid future mistakes. *Disaster Victim Identification: Experience and Practice* presents a selection of key historical incidents in the United Kingdom and includes candid discussions of potential areas for improvement in preparedness and future deployment capabilities.

Each chapter in the book addresses a specific disaster and covers a number of main points in relation to the incident. For each event, the book presents data such as the manpower available at the time of the disaster, the number of officers involved in the deployment, and their relevant experience at the time. Details of the disaster follow, as well as the recovery and identification methods employed, the number of fatalities and casualties, and lessons learned. The book also explores the short- and long-term effects that the disaster had on the response team and the community. Finally, each chapter examines important present-day developments in relation to the event. The book summarizes important aspects of the particular disaster in terms of legislative, moral, practical, or other contributions to the field of mass disaster planning, preparation, and deployment on a wider scale.

Viewing disaster management from a global perspective, this volume contains the combined input of academics, forensic specialists, trainers, and law enforcement professionals who focus on actual cases to honestly assess events and provide recommendations for improvement.

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